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Macintosh Products Reviewed and Rated



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His No-fuss software that makes backing up an overnight success





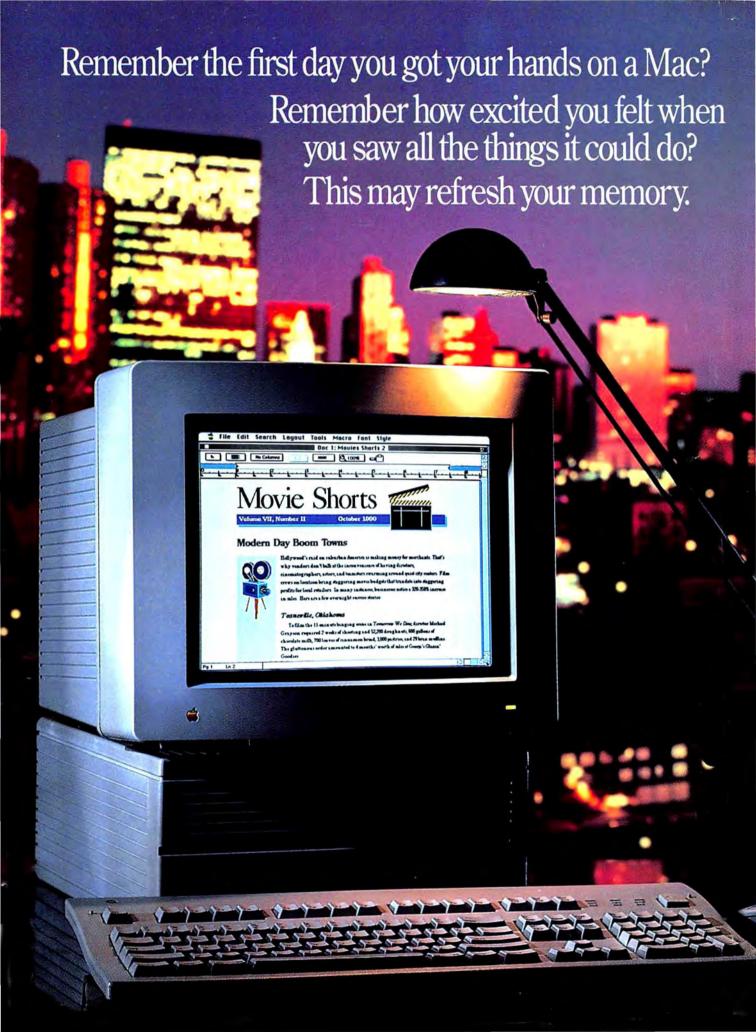
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..... more!



McInTax

Aldus PageMaker





Introducing WordPerfect® 2.0.

Every once in a while a new product comes along that sparks the same kind of excitement you may have experienced with your first Macintosh (you stayed up half the

night, right?). As we've shown new WordPerfect® 2.0 to Macintosh users around the country, we've seen a very similar reaction. First eyes open wider. Then heads start to nod. Followed by grins that stretch dimple to dimple.

Here are some of the more graphic improvements.

We built a graphics and drawing package right into the program. With

WordPerfect 2.0, you don't have to leave your document to incorporate graphics. You can create, edit, size, scale and crop graphic figures just by clicking "graphics" or "draw" on the pull-down menu. The palette includes all of the standard drawing tools, plus Bezier curves, polygons and a free rotation tool.

WordPerfect 2.0 also lets you create text boxes. Inside our text boxes you can change font size and attributes. Then you can drag your text box wherever you want in your document and the rest of your text will wrap around it automatically.

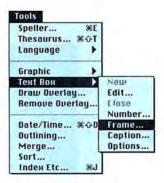
Tools

Speller... **E
Thesaurus... **©T
Language

Language

The list of new features could fill a page. Or up to 24 columns.

By clicking and dragging icons on the new WordPerfect ruler, you can create columns (newspaper or parallel) and then adjust the column settings, align text, set tabs, change line spacing, move margins and do a number of other formatting changes to your document.

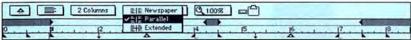


Want to add a border to text, paragraph, column, or page? Easy. WordPerfect 2.0 gives you 36 different border styles from which to choose.

Like working with Styles? WordPerfect not only lets you use them, you can also share your styles with other people on your network.

We've also added new

O 100%



features like a Macro Editor, Tables of Authorities, and Line Numbering. And we've made enhancements to Merge, Search and Replace, and Macros.

Of course, what counts is how you feel.

See WordPerfect 2.0 up and running at your dealer. Better yet, buy a copy of WordPerfect 2.0 and load it onto your Mac. But when you try WordPerfect 2.0 for the first time, one word of warning. Don't plan on going to bed early.

For more information, call us at (800) 526-5012.

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MacUser

AUGUST 1991

Volume 7 Number 8 Cover photo by Walt Denson





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On-line help is only a phone call away.



112 Back up your network automatically, 24 hours a day.



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1,000 hardware and software reviews everything from Aldus to Zedcor.



Features



MEISH Putting Your Mac on TV: **Desktop Video**

BY PAUL YI AND THE MACUSER LABS STAFF The Mac is a great tool for creating information, and video is an ideal way to distribute it. Put your next Mac presentation on videotape — or blend Mac graphics into a videotaped presentation. MacUser Labs explores the video options for business applications by testing six devices that offer everything from simple video output to special-effects wizardry. 94



Men Overnight Success: Network Backup

BY VERNON KEENAN, KELLI WISETH, AND THE MACUSER LABS STAFF

Stop begging everyone in the office to back up critical files. Using one of the five network-backup packages tested by MacUser Labs, you can automate the process. Network-backup software lets you set up an unattended central backup-server system. 112

MiniFinders Buyer's Guide

What do you call 1,000 Mac products chasing after five mice? MacUser's MiniFinders, of course. Our biggest buyer's guide ever has capsule reviews of 1,000 hardware and software products - from reliable hard-disk drives, snazzy color printers, and that big-screen monitor you've been eyeing, to powerful spreadsheet programs, intuitive word processors, and a beltful of utilities. Whether you're buying your first Mac or upgrading a \$20,000 IIfx-based system, this is the reference you'll turn to. 135

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Authorware	D	

Simply the best software-development environment for building interactive training applications — for veteran multimedia developers, absolute beginners, and every-

Pinnacle Micro REO-6500 and **PLI Jukebox Junior**

The ultimate in optical storage - two optical-disc-drive jukeboxes that can swap up to ten discs in and out. The result is a total networkable storage capacity of 6

SwivelArt, Swivel 3D Professional, and MacRenderMan

A trio of 3-D packages: A fun collection of 3-D clip art, a powerful 3-D-modeling program, and a photo-realistic rendering program60

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Small and easy to use and - because it's an ADB device - it won't hog the serial ports, but it might lack some abilities you need.64

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Two doses of strong medicine for computer viruses that help protect against infection and provide remedies if your disk does get sick75

American Heritage Electronic Dictionary: 116,000 words, 500,000 synonyms, and no page flipping. The Rite of Spring: A masterful and entertaining hypermedia explication of Igor Stravinsky's landmark ballet score. The Book of MIDI: A HyperCard primer on merging Macintosh computers with musical instruments. RoboSport: Battle-strategy simulation where robots do

"The only thing MacroMaker's useful for is seeking an answer to the legendary philosophical question 'Was MacroMaker written to make all Microsoft programs crash, or are all Microsoft programs written to make MacroMaker crash?' Very Zen."267

"Try this free. You'll be hooked."



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Guy Kawasaki, Mazintosh Evangelist

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If you have a Mac question or problem, send it to Help Folder, c/o MacUser, at the above address, or for a personal answer to your problem, type GO TECHSUPPORT on Zmac, You should also take advantage of local user groups. You can find the one nearest you by calling Apple toll-free at (800) 538-9696, ext. 500.

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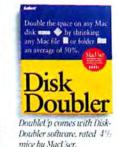
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Color monitor illustration by Rob Mageira

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The other members of the family are just as cost conscious. From the lightning fast "highly recommended" 660MB drive (*Macworld*, July 91)

No Introduction Needed.

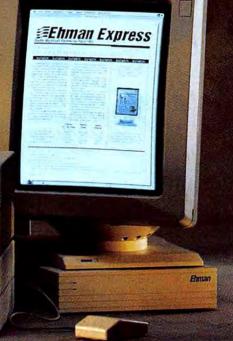
"At \$899, Ehman's Two-Page Monochrome display is an excellent buy."

MACWORLD, MAY, 1991

"If you want a full-page display, we recommend the Ehman: it's rare to find such high quality and low price (\$499) in the same monitor."

MACWORLD, MAY, 1991





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External	\$129	\$269	\$289	\$249	\$359	5319	\$379	\$459	\$789	5749	\$1,289	\$1,999	\$489
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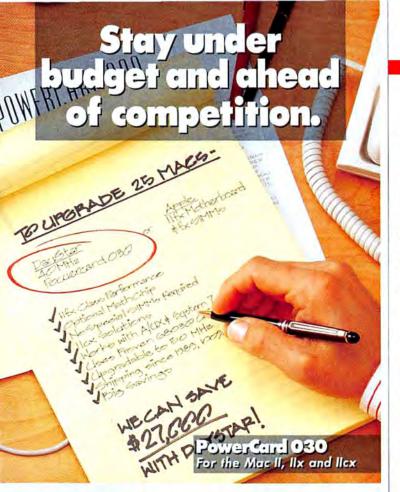
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MacUser

Land of 1,000 Reviews

nyone who reads MacUser regularly knows that we like to review products. Even the editors, however, are sometimes taken aback at the sheer scope of the product coverage that has appeared in the magazine during the past six years. Our MacUser product database contains vital information on 3,000+ Macintosh products that we follow on an ongoing basis. And it includes summaries of more than 1,000 Mac products that have been reviewed and rated in MacUser.

These review summaries appear four times a year in MacUser as MiniFinders (named after an early Mac operating-system

feature that proved less durable than its name-sake). Once a year, they appear as a blockbuster MiniFinders Buyer's Guide, such as the one in this issue. The other three MiniFinders reports are updates that cover important subsets of the database: Hardware, Desktop Publishing, Graphics, and so on.



Bruce Mewhinney tracks thousands of reviewed and rated products so that MacUser can bring you MiniFinders.

MiniFinders may be small reviews, but com-

piling more than 1,000 of them is a big job. The product-listing database on which MiniFinders is based must be updated and revised constantly — often daily — as products are introduced, revised, and discontinued.

MiniFinders Keeper

How do we do it? Associate editor Bruce Mewhinney uses Claris' FileMaker Pro to keep tabs on products, because it's easy to use and can be modified on the fly. Getting the MiniFinders out of the database and onto the pages of the magazine was a difficult and time consuming-process until we started using a product called DataShaper, from ElseWare (Seattle, Washington; [206] 547-9623). This inexpensive (\$179.95) database-publishing tool lets Bruce smoothly take the information out of the FileMaker Prodatabase for the art department to pour directly into a PageMaker layout, without a lot of processing.

By themselves, the MiniFinders reports make the MacUser product database useful to readers. But the database also feeds our electronic-publishing projects on Zmac, MacUser's on-line service. On Zmac, readers can search for the latest MiniFinders without being constrained by the lead times inherent in magazine publishing. Although the information in this issue was current three months ago, you'll find today's information in Zmac's interactive Buyer's Guide database of 3,000+ products.

For HyperCard users, Zmac also has a MiniFinders stack. Updated quarterly, it's available exclusively on Zmac.

Producing MiniFinders will never be an easy job, for the encouraging reason that the number of products in the Mac marketplace continues to grow. Even more encouraging is that some of the products we're covering are also helping us do the job better.

TYPHOID (AROL.



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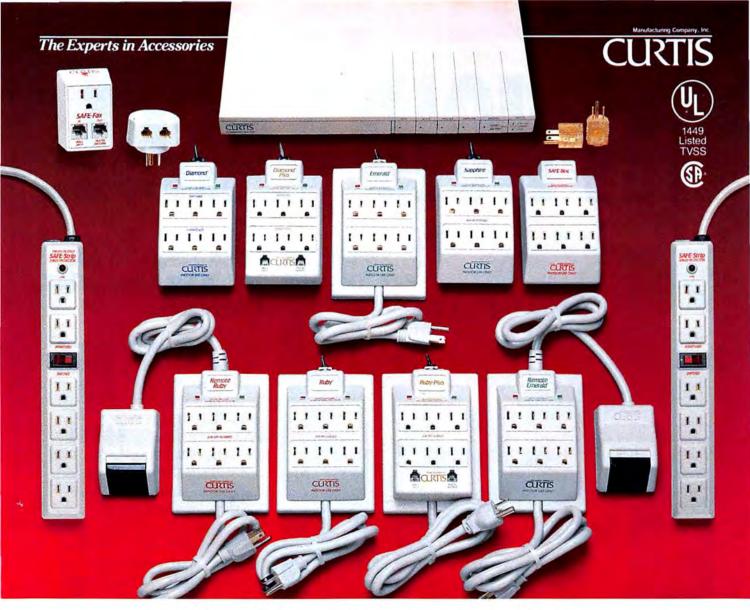
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LETTERS



Paul J. Galanti, of Indianapolis, Indiana, has product placement on his mind: "Does Judge Harry Stone actually use his Mac in "Night Court"? And was that really a copy of the August 1990 MacUser on the subway newsstand in the movie The Hard Way? My question: How much did it cost MacUser to get such a prominent spot next to the phony magazines with Michael J. Fox's picture?"

We can't speak for Judge Stone, because he's a makebelieve character. But Harry Anderson, the actor who plays him, is a Mac user (and developer), who's even threatened to write something for us someday. Harry?

As for The Hard Way, its director, John Badham, is simply a big fan of the Mac—and MacUser. We might, however, pay to be featured in Kevin Costner's next epic—Dances with Mice.

⊠ Write to Letters to the Editor, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404, or post your letter on the MacUser Forum of Zmac, our on-line service.

All letters become the property of MacUser, and we reserve the right to edit any letters we print. Please include a return address and a daytime phone number.

Seven's Deadly Sins

As I look at System 7.0 ("70 Things You Need to Know About System 7.0," June '91, page 96), I think, "Wow, perfection!" But there's always room for improvement. Here's one I'd like to see in System 7.1.

To add any file to the Apple menu in System 7.0, you must add the file (or an alias) to Apple Menu Items in the System Folder. Then you have to open the System Folder if you want to access the file. I'd like to be able to add a file to the Apple menu simply by placing the file icon (or alias) on top of the Apple icon that appears at the top of the menu and then releasing the mouse button.

System 7.0's method of adding files to the Apple menu is much easier than was adding DAs to System 6.x. My idea takes the "convenience factor" one step further.

Brett Rohring Huntington Beach, CA

Image Versus Style

Thanks for the review of the two new Apple printers (May '91, page 90). Before I trash my Venerable ImageWriter II (VIW), could you please clear up a few things that the authors left out? How easily do the new machines handle envelopes and peel-off labels? Do they have a draft setting like my VIW's? As a programmer,

I routinely print draft-quality copies of code running to 100 pages or more. It takes my VIW an hour or more to do this — I grab some corn chips, switch on the tube, and wait for the printer racket to quit. I extrapolate from your article that the same job with the StyleWriter would take about ten hours. Is this true?

Mary Godwin Orlando, FL

The StyleWriter's envelope slot makes it easy to insert envelopes, and the straight-through paper path enables the StyleWriter to print envelopes and labels perfectly. In contrast, our testing shows that ImageWriters often smear envelopes and chew up labels.

As for speed, one page of our standard Microsoft Word 4.00D test document printed in about two minutes in Best mode and in half that time in Faster mode. An ImageWriter prints swiftly in Draft mode, but that mode omits any graphics and severely limits your choices of font style and size. A StyleWriter in Faster mode, on the other hand, can print everything you see on-screen, just at a lighter density and slightly lower resolution.—PF

Consuming Passion

Your review of Apple's new printers relegates the ImageWriter to people who can't bear the slow print times of Apple's StyleWriter

Dear Mr. Sculley . . .

When Apple finally unveiled System 7.0 on May 13, the real news was how the marketing mavens of Cupertino intend to convince customers to switch to it. For instance, the \$99 Personal Upgrade Kit includes both the nifty Compatibility Checker and 90 days of free phone support. And freeloaders can even hear a 24-hour recorded telephone message that answers the 20 most commonly asked questions about System 7.0 (never mind how Apple knew what those questions would be before it shipped the software). But is all that enough to make users forgo safe System 6.x?

Speak Up: Do you plan to switch to System 7.0? When? Why?

Send your thoughts to Dear Mr. Sculley, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

In May we asked readers what features Apple should include in a notebook Mac.

Howard Bulloch, of Las Vegas, Nevada, was more than happy to share his wish list: "Size comparable with that of the Sharp PCb220 or Texas Instruments' Travelmate 3000, with a 60- to 80-megabyte hard drive, high-resolution backlit display monitor with a large screen area, external-color-monitor connectivity, and a builtin 1.44-megabyte floppy drive."

Lester H. Hoyt, of Indianapolis, Indiana, likes to think light: "Here's how to get the computer down to a couple of pounds and a thickness of about half an inch:

- Get rid of the hard drive and those lead-acid batteries needed to run it. Instead, put in four 16megabyte memory chips, for 64 megabytes of storage RAM, powered by readily available 9-volt dry cells or AA cells. They should last for months with no other drain on them.
- Have separate, switchable dry cells to power the screen, which would be the only part requiring real power.
- Include a SCSI port for external storage, the usual ports, and a plug-in external floppy drive with its own dry cells or 110-volt AC power."

Another light-minded reader is John Bradford, of Chicago, Illinois: "Apple should forget about competing with the current crop of DOS notebooks and leapfrog straight to the next generation — which is ably represented by Hewlett-Packard's new 11-ounce 95LX complete with Lotus 1-2-3 built in to ROM."



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LETTERS

or the higher cost of HP's DeskWriter along with those who need a cheap (in both senses) color printer and those who print multipart forms.

But you forgot to discuss the cost of consumables for these printers. In your November '90 lab report on QuickDraw printers ("Affordable, Laser-Quality QuickDraw Printers," page 134), you mention that ink cartridges for the HP DeskWriter have a list price of \$19.95 and deliver 250 to 300 pages — a cost of 7¢ to 8¢ a page. Toner for the LaserWriter SC lists for \$99 and delivers 3,500 pages — a cost of about 3¢ a page. On the other hand, ImageWriter ribbons cost me about \$3.50 by mail order and deliver many printed pages — easily 200 — for a cost of 1.75¢ a page or less.

In a setting in which the printers are often running ten hours a day, it has been my experience that an ImageWriter also delivers good printed copy at a low cost. Your review was, I think, a little high-ended. Please keep the rest of us in mind.

Robert J. Yanal Detroit, MI

But you haven't factored in the cost of time. A printer that spits out ten times as many pages is well worth the higher cost of consumables to most people — especially if the printer is running nonstop, as yours is. — JZ

Book Stand

I find it terribly sad to hear Ted Nelson talking about setting up stands to sell information, in Michael Swaine's column ("Next Year in Xanadu," June '91, page 49), as though it were a new and revolutionary idea.

The United States has had, ever since Ben Franklin, a long tradition of local "information stands"—the public-library system. Better yet, the information has been provided free to everyone, regardless of money in pocket, and the cost has been borne by the entire community. Unfortunately, public libraries today are in the process of being defunded and shut down across the country.

The carrion eaters are stepping in to take advantage of the slow execution of free public access to information. As with so many technology issues, the new techniques can benefit many or few, depending on who controls them, for what purpose, and with what vision. It seems to me that we should be able to provide a decent library system that includes

exciting technology such as Xanadu, for the benefit of all, regardless of income or resources.

Jim Davis Sausalito, CA

More Safe Than Sorry?

Greene's A.M.E. (May '91, page 68) was unjust. I admit that the program presents some difficulties. In addition to woes with A.M.E.'s requiring an installer, how about the way A.M.E. makes some communications programs (such as VersaTerm-PRO and Mathematica's network portion) freeze out the screen when they're going through the phone port? And you can't altogether restrict users' access to the hard disk while still letting them run applications from it, because some programs (such as MathCAD) insist on writing files in their own folders.

However, A.M.E. is absolutely the only security package that lets you set up a public-access Mac that any person, no matter how inexperienced, can use without any chance of wiping out programs and system files. It also prevents virus contamination and illegal copying of software.

I manage a public Mac that is used regularly by nearly 50 people. Before A.M.E. my life was miserable: I spent countless hours rebuilding the system, which was frequently damaged, accidentally or on purpose. I have used A.M.E. from version 1.0 on, and it has always worked as promised.

Rostislav Serota Cincinnati, OH

Users with stringent security needs should consider A.M.E., as noted in the review. However, Casady & Greene represented the product to us as a security program for the masses, and it's not. Most Mac users don't need it or the restrictions it imposes on their work habits. There are simpler, more forgiving programs out there for the occasional folder or file you want to protect. Even those who have rigorous security needs should first try lower-end programs such as FileGuard or Empower. — GW

LC or Not LC?

I've been contemplating purchasing either a Mac LC or a Mac IIsi to replace my Plus. After collecting information for a while and being aided greatly by your article "Three Cheers for Three New Macs" (December '90, page 90), I reluctantly

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MacDraw Pro doesn't. Canvas 3.0 gives you more technical drawing features. Like custom dynamic

hatching. Custom parallel lines & curves.
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perimeter calculations. And a Smart
Mouse™ drawing aide.

MacDraw Pro doesn't.

Canvas 3.0 gives you more design/illustration features. Including unparalleled Bézier curve editing power--from multipoint selection & editing to automatic object conversion, combining and blending. Magnetic guidelines. Center line auto tracing of scanned images. And full bitmap editing in 24-bit color.

MacDraw Pro doesn't.

Canvas 3.0 also gives you new built-in translators for important multi-platform formats like CGM,
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MacDraw Pro doesn't.

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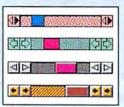
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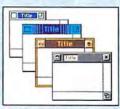
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LETTERS

decided to pass on the LC, because it lacks a floppy port, a PMMU, and a math coprocessor and because it has only a 68020 processor. Then I read a New on the Menu piece about 68040-based accelerators (May '91, page 49), and my hopes soared. (The mere thought of an LC blowing past a IIfx!) But I still don't have enough information. Would you please do a review (preferably a lab report) on 68040 accelerators?

Frank McLaughlin

Lennon, MI To date, we'

To date, we've seen only one 68040 accelerator for the LC: the TokaMac, from Fusion Data Systems (Austin, Texas). It draws less than 4 watts, thus fitting within Apple's stringent power and heat guidelines for LC cards. — JP

Driving a Hard Bargain

In "Life Begins at 40 Megabytes: Small Hard Drives" (April '91, Buyer's Guide page 4), you say, "If you haven't yet bought your Classic and you know you'll want a 40-megabyte hard-disk drive, you're better off buying one built in by Apple — if you can put up with its poky performance."

OK. Understood. Go with Apple's internal drive. Cost-effective, not too slow. But then the article says, "... if you're considering buying a Mac Classic, think seriously about buying one of the drives we recommend instead of opting for the 40-megabyte Conner mechanism that Apple bundles in the \$1,499 version of its low-priced gem ... you will gain a faster drive that, being external, can easily tag along as you move up the Mac's evolutionary ladder."

Huh? This directly contradicts statement

Please clarify.

David K. Balcom

Fairfax, VA

The Classic's internal hard drive is a good buy compared with an external unit. But an external drive offers portability and better performance if and when you move up to a Mac with faster SCSI throughput. Thus you have two mutually exclusive best options—one for now, one for later.—BM

Slow Growth Path

I have a gripe about software that is optimized for 68030-based Macs. These programs just crawl along on all the 68000-and 68020-based machines (Classics, SEs, LCs, and Mac IIs).

Take Managing Your Money. Please.

We loyal MYM users waited a long time for the new version, but using it on a 68020 machine is like pouring molasses into the drive. For example, it takes up to 13 seconds to change days in the reminders. By comparison, backing up is a lightningquick delight.

Meca's literature apologizes for abandoning the few MYM users who lack a hard drive, but it says nothing about abandoning the many whose Macs lack 68030s. And Meca has no plans to help us. At least Meca will return the upgrade fee to users like me who have decided that this year's speed degradation isn't worth the

Dennis W. Mack New York, NY

Bad Engineering

One of my friends who designs the expensive equipment John Dvorak discusses in "Let's Spell Mac B-o-r-i-n-g" (May '91, page 348) goes even further. My friend says the Mac is becoming an application-specific machine and is losing out in the general computing market. He attributes this to Apple's lack of cooperation with third-party developers.

Apple is also losing out in the engineering market. There is only one good engineering program for the Mac—PSpice—and a few poor ones. Apple won't help companies with good programs for PCs and workstations port their software to the Mac. All Apple needs to do is fund the porting in return for royalties. I suspect that the payback for this in increased Mac sales would occur in just a few years or less.

Apple is going to be in for a surprise with its engineering-workstation efforts. No one is going to buy a workstation without software.

James Long

Sunnyvale, CA

It is exactly because of its available software that the Mac is the best microcomputer platform for scientists and engineers. I've reviewed dozens of scientific and engineering applications in different areas of expertise, and many are unique to the Macintosh. These include MacUser Editors' Choice Award winners National Instruments' LabVIEW, for data acquisition and control, and Prescience's Theorist, an equation solver and animator. Both programs are unequaled on any platform.

In addition, Spyglass Transform, from Spyglass, is peerless for turning numbers



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LETTERS

into raster images or vector and surface graphs, and Image Analyst, from Automatix, brings workstation image processing to the masses. There's also Strawberry Tree's Workbench, StructSoft's TurboCASE, Wolfram's Mathematica, and Odesta's Data Desk as well as Mac versions of high-powered statistics programs such as SPSS and Systat. And let's not overlook the several dozen excellent professional-level CAD programs that make the PC's AutoCAD pale in comparison.—JR

This War Is Heck

Owen W. Linzmayer's four-and-a-half-mouse rating of Accolade's Stratego ("Stratego: The Computer Game," May '91, page 88) was about two mice too many. Despite its ease of play and attractive visuals and sounds, I no longer play it. Linzmayer said the program is "somewhat predictable." In fact, even at its highest level of ability, Stratego has no strategy and is unpredictable. The rule variants make it more challenging, but winning is still too easy.

The programmers at Accolade apparently left out a critical step in creating a strategy game: consultation with game experts to develop rules of logical play. Accolade needs expert help in revising Stratego to make it truly challenging.

Gregory Tetrault Omaha, NE

Seasoned strategists may find Accolade's Stratego too easy to beat under the standard rules — I'd love to see General Schwarzkopf consulted for an expert system. But I feel that the existing rule variations make the game challenging enough to merit four and a half mice. — OWL

Beating the Systems Analyst

In Power Programming (May '91, page 259), the authors call programming a specialized art form requiring logical and analytical skills and training. They then intimate that those unable even to program a VCR shouldn't try to become programmers but rather should become systems analysts, system designers, or human-factors practitioners.

What nonsense. Computer Weekly once said "The programmer is paramount to the non-data-processing literate, but it is the systems analyst that is the modern embodiment of the Renaissance man." In many corporations, excellent programmers are often promoted to systems analysts.

As for human-factors practitioners, where would the Macintosh's graphical user interface be without them? Who would even need a programmer but for the teams of professionals who are instrumental in the successful creation of hardware and software products that inspire others?

Judy Hochsztein Bergenfield, NJ

One for the Road

Your news item on the "new" Mac Portable (New on the Menu, June '91, page 54) brought a rueful smile to my face. The best Mac portable is a laptop that barely tips the scales at 9 pounds . . . not 15. And it isn't made by Apple but by Outbound Systems in Colorado. I bought one a year ago, and I haven't been disappointed with the choice. The Outbound is my main machine now. It's well made and intelligently designed, and it stands up to life on the road.

The only way I can be brought back into Apple's fold is if the company produces a true Mac notebook computer before someone else does. Is Apple equal to the challenge?

Andrew E. Stevenson Fairfax, VA

Clarifications

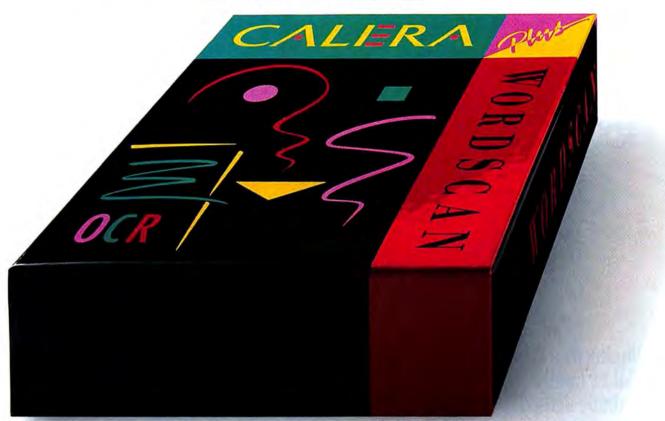
In the features chart for "Building a Better Network with EtherTalk-to-LocalTalk Routers" (April '91, page 168), the Cayman GatorBox, whose network-security features include configuration protection and resource hiding, was listed as not having these features. The Gator-Box's resource hiding includes zone, printer, and device filtering.

The correct price of Brøderbund's PlayMaker Football game (Quick Clicks, May '91, page 88) is \$49.95.

The "On the Horizon" sidebar in "Easy Hard Copy: Color PostScript Printers" (May '91, Buyer's Guide page 50) mentioned that PostScript ability for the Canon Color Laser Copier 500 will soon be available from CAI (Custom Applications, Inc.). In fact, CAI has provided CLC 500 support since the 1990 debut of Freedom of Press Professional for the Macintosh (version 3.0) and has steadily improved it since then with features such as anti-aliasing.

The correct phone number for Wildflower Software, maker of SnapJot (Quick Clicks, June '91, page 89) is (708) 916-9360.

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Guess

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The totally redesigned ScanMaker 600Z offers bigber resolution for a lower price.

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But the most dramatic news is that we've given it an incredible low price to match.

Add to

that a sleek, compact design that fits neatly in your work space. And you've got the color scanner that others will be hard pressed to match.



Both ScanMaker models include eitber PhotoStyler or Adobe Photosbop, absolutely free.

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MacUser September 1990

"...the Microtek MSF-300Z is a clear winner. again, because it MACWORLD comes complete and the software is easy to use." Macworld August 1990

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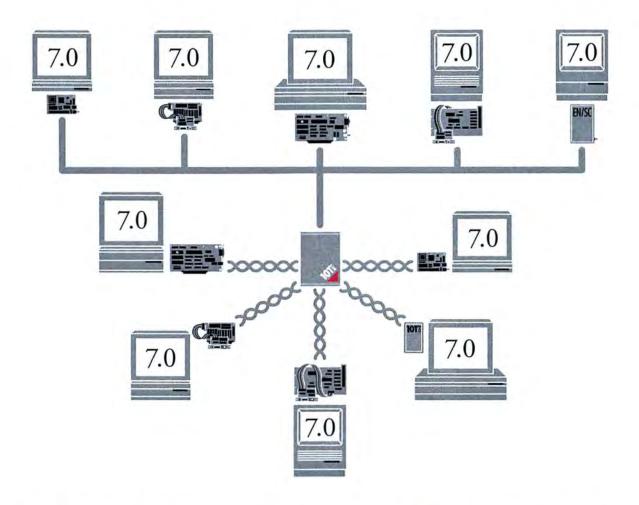
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Compatibility Checkmate



Frustrated by applications that are incompatible with System 7.0? Then you'll love this quick-and-easy recipe for System 8.0, straight from the MacUser test kitchens.

he Colonel had his secret recipe of seven herbs and spices. The Coca-Cola corporation guards the proprietary formula for its sugar water in a special safe in a locked room, patrolled 24 hours a day by two armed guards named Bubba. And I've got two secret recipes guaranteed to spice up your life.

If you want the secret to my surefire fivealarm Toto-I-don't-think-we're-in-Texasanymore chili, you'll have to keep watching this space, because this month I'm going to outline the other one. It's the recipe for E-Z No-Bake Instant System 8.0.

Apple's System 7.0 took literally hundreds of man-years; No-Bake 8 takes a couple of hours on the phone with your favorite mail-order-software house and 11 easy steps. System 7.0 gives you some powerful features you can't use until the publishers of your software exploit them in their upgrades; No-Bake 8 gives you features you'll use right off the bat. System 7.0 comes free with every new Mac; No-Bake 8 comes free to every Mac-magazine editor (but you knew there'd be a catch, right?).

We'll get to the recipe in a moment. First, you should know why I decided it was time to become the Julia Child of operating systems.

After two years of delays — excuse me, after 24 months of refining the concept — Apple formally released System 7.0 at its annual Worldwide Developers Conference last May 13, with all the hoopla and fanfare that such an overdue — er, overflowing — product deserves.

Like most of the attendees at the event, I got the System 7.0 box home as fast as I could and started popping floppies in and out of my Mac faster than a toaster on steroids. The first thing I did, of course, was run the Compatibility Checker. The Compatibility Checker is one of the niftiest things Apple's come up with in a long while. It automatically surveys your hard disk, tells you what's wrong with it, and even offers to do some of the housecleaning for you.

My Compatibility Checker told me that I had seven forbidden pieces of software that had to be removed from my System Folder before I could install System 7.0. Which means I have to unlearn seven die-hard habits I've grown accustomed to with those verboten INITs—at least until compatible versions come out.

No problem — most of these INITs wouldn't be all that necessary anymore, anyway. Farewell, faithful Suitcase. Bon voyage, Boomerang. Au revoir, After Dark. Toodle-oo, On Cue. CompCheck politely offered to store these in a folder that (like some trunk stored in the attic) it knew I would want to keep on my hard disk but was sure I'd never have occasion to peer into again.

But, so far, things weren't looking too bad. OI' CC found a few redundant copies of the System file — again, no problem, they're history. Next came a list of about 20 applications that — good news! — were fully compatible with System 7.0. None of them did anything new under System 7.0, mind you, but Apple was pretty sure that running them wouldn't crash my spanking new system.

Then CC decided to play hardball.

The Unfortunate 500

About 50 items needed upgrading to currently available new versions that I hadn't gotten around to getting yet. Another 100 were incompatible in their latest version. And my fair-weather buddy, CC, had never even heard of the remaining 500.

Let's skip over the question about why on earth I'm wasting space on my hard disk with hundreds of apps I'll never use again. (Look, maybe someday Reflex will make a comeback.) Most of those 500 ancient programs have probably been incompatible under the last two or three System releases anyway.

But I still have 50 items to upgrade. Compatibility Checker provides phone numbers for calling all those third-party vendors for upgrades. Which leaves me with a bit of work: 50 phone calls to make, 50 serial numbers to dig up, and 50 purchase orders to request (if the upgrades aren't free), not to mention 50 upgrade fees to part with. Even "nominal" upgrade fees (which can easily be \$50 or more these days) are going to add up.

And I have to keep monitoring the situation to know when it starts all over again with the remaining 100 incompatibles.

Pieces of Eight

Apple could have avoided such nightmares by cooking up a new System built on timetested utilities from some of its faithful third-party software developers. Because Apple didn't, you can do it yourself. All it takes to cook up System 8.0 is the following recipe of 11 not-so-secret ingredients.

Start with DOS Mounter, from Dayna Communications, or AccessPC, from Insignia Solutions (see John Rizzo's "Disks of a Different Color," in this month's Bridges section, for a review of these two). Either utility makes navigating your way through DOS disks as easy as finding a file on a Mac floppy.

Another pair of utilities can help anyone who's ever been frustrated by the Application Not Found dialog box. First, HandOff II, from Connectix, lets you bypass that annoying box by mapping documents created by an application you don't have so that they'll open with a compatible application you do have. (Among other tips in his Beating the System column this month, Bob LeVitus points out that System 7.0 will do this, but only for text and PICT documents that can be opened by TeachText.) And DataViz's MacLinkPlus/Translators is indispensable for anybody who needs to shuttle documents among any of dozens of applications.

Next, jazz up your system with Articulate Systems' Voice Navigator II to add voice-activated command and control to everything you do. And to dress up the look and feel of the Finder, Dubl-Click's ClickChange gives you dozens of ways to update the appearance and operation of windows, scroll bars, cursors, and more.

If you have a Post-it note taped to your Mac to remind you to "Save often!", you'll appreciate the functionality of AutoSave II, from Magic Software; you'll never have to think about saving documents again. And to make backing up your files a no-brainer, toss in Magic's Backmatic. (For network-backup alternatives, check out this month's "Overnight Success: Network Backup.")

If you want to simplify Life With Fonts once and for all, get the Adobe Type On Call CD-ROM (or similar discs from Agfa Compugraphics, Image Club Graphics, NEC, or Monotype). You'll have just about every font you might ever want — you pay to unlock just the ones you need, whenever you need them.

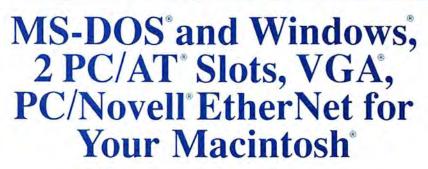
You'll have a CD-ROM drive for that font disc, so let's toss in Microsoft's Bookshelf CD-ROM, which puts a library of reference books on call. But because it's a DOS disc, you'll need Insignia Solutions' SoftPC DOS-emulation software to run the disc — and any other DOS software you need.

Finally, realizing that things do occasionally go wrong, we're going to include Farallon's Timbuktu/Remote. Now your network manager or even your Apple dealer — using the same software on his end — can train you or diagnose your Mac and your hard disk from his own desk,

How much is this gourmet System 8.0 feast going to cost? All told, about \$2,000 — no small potatoes, but you can get it now, you can get it tested, and you can get just the pieces you want. And it all runs under System 6.x.

Even better, you can tailor the recipe and the cost—to suit your taste—and budget. You can choose your own substitutions from this month's MiniFinders, a cookbook of 1,000 Mac hardware and software ingredients.

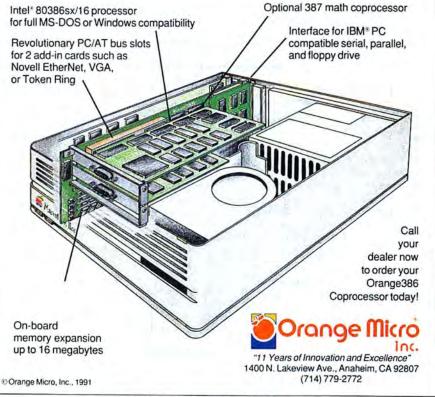
Bon appétit!



Örange 386

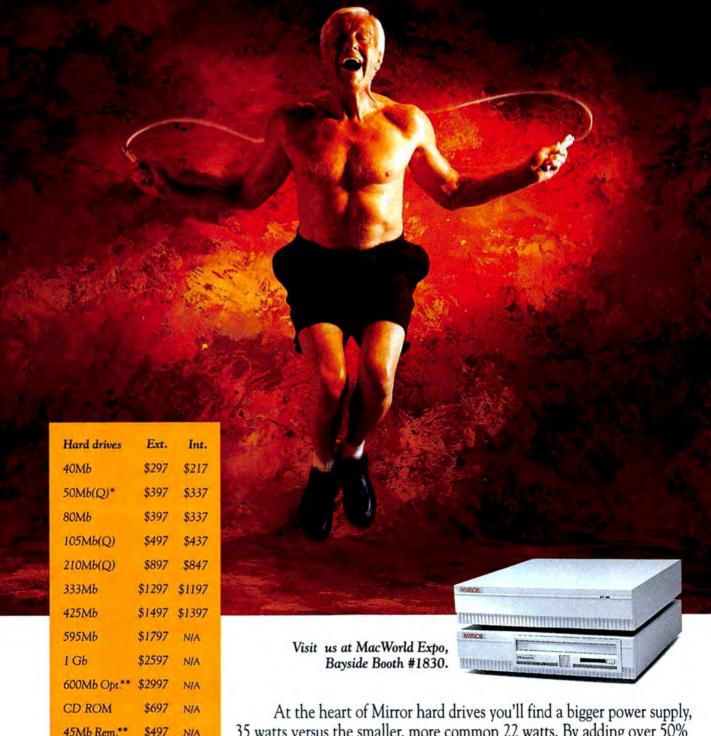
MS-DOS Coprocessor

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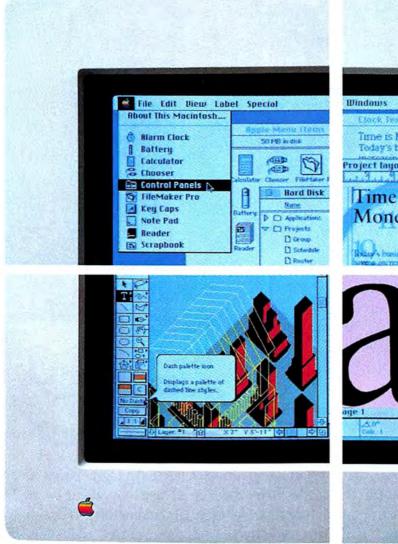
What's on the Apple menu? You decide, by dragging any document or application into the Apple Menu Items folder. To open it, just click. And for a quick way to see what's inside a folder, click the triangle next to it.

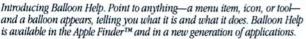
number above the coupon. But if you'd like a reminder of what System 7 is all about, please read on.

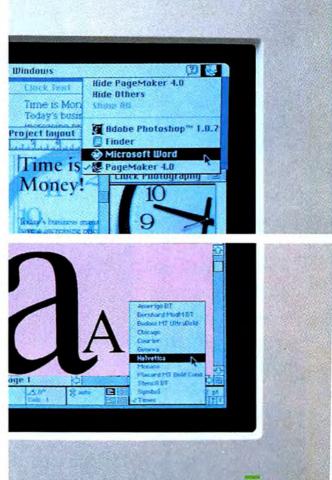
More powerful capabilities. More ease of use.

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With TrueType, even the largest letters display perfectly on the screen, with no jaggy, "staircase" edges. You also get terrific printed output with almost any kind of printer. And System 7 is compatible with the fonts you already have.

the Macintosh on your desk.

We've also made Macintosh easier to use. For instance, take a look at Apple Balloon Help, our new on-line help feature. Point to an item on the screen, and a balloon pops up next to it, telling you what it's for. So applications are quicker to learn, and easier to make the most of.

Everything gets smoother and simpler.

With System 7, there's a big improvement in big type. Thanks to Apple's TrueType™ font technology, you get perfectly smooth letters on the screen, no matter what their size, along with more professional-looking output. And you don't need the Font/DA Mover. To install TrueType fonts, just drag their icons into the System Folder. (Ditto for desk accessories.)

Open an application. Work. Save. Quit. Open another application. Until now, that's how you've probably moved from, say, a word processing program to a spreadsheet. With improved multitasking, you can keep several applications open at once, and choose between them with a mouse click. So you don't have to stop what you're doing to print, search for files, duplicate files, or share data.

Using applications simultaneously can demand lots of memory, but with System 7 you aren't likely to see a not-enough-memory message. Because there's virtual memory.* When you need extra memory, just tell System 7 to use the spare room on your hard disk. Your Macintosh will work without interruption, and so will you.

See what's developing.

System 7 gives developers a far-reaching new set of tools, enabling them to offer applications that do new things for you. For example, to the fame and success of cut and paste, we've added publish and subscribe. Change something in one document, and it can change—automatically—in every document where it appears. Even if the documents are in different applications or on different computers across a network.

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We could go on. But the main point is really this:

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Spreadsheet Skirmishes



After years of total domination by Microsoft Excel, the spreadsheet-program market may finally be getting some real competition.

t's almost as though there were an unwritten law reminiscent of Henry Ford's Model-T philosophy: Macintosh users can buy any spreadsheet program they want, as long as it's Excel.

Although Bill Gates probably didn't mind maintaining that kind of a monopoly on the Mac spreadsheet-program market (at least not until the FTC came calling), it didn't leave Mac users with many options when it came to choosing what's probably the single most important personal-computer application for business.

That's about to change, though, because Mac users are about to witness the spreadsheet shootout of the decade. Two powerful new challengers to the perennial champion are going to debut almost simultaneously. In other words, anyone shopping for a spreadsheet program is going to face some real choices.

We haven't always been so lucky.

Once upon a Recalc

When the Mac was introduced in 1984, Microsoft's Bill Gates and Lotus' Mitch Kapor flanked Steve Jobs at the podium. They represented the two most important software-development companies that were working on programs for this new and unusual mouse-based machine.

Microsoft was the first to market with Multiplan, a program that was severely hampered by the Mac's 128K memory limit as well as by the lack of a hard drive. Compared with 1-2-3's features and performance on PCs, Multiplan's abilities came up short. Still, Multiplan did one thing very convincingly: It demonstrated how the mouse and the spreadsheet were made for each other. Multiplan's interface pointed (and clicked) toward the future of spreadsheets.

But Multiplan wasn't 1-2-3. And business users weren't aware that in a few years, they would be lining up to buy Microsoft Windows just so they could point and click at spreadsheets on PCs too.

Meanwhile, Lotus waited for the arrival of the 512K Mac before it shipped its own contender. But rather than ship a speedy, elegantly efficient 1-2-3 with a terrific Mac interface, Lotus snatched defeat from the jaws of victory with Jazz.

Jazz was a variation of Symphony, Lotus' less popular and less powerful integrated PC product. Jazz included some nice bells and whistles, such as HotViews (which we've had to wait six years to finally see reappear with System 7.0's interapplication communication), but the whole of Jazz was less than the sum of its parts. To fit five applications (spreadsheet, word-processing, charting, communications, and database programs) into 512K of memory (not to mention a maximum of 800K of disk space, including an external floppy drive) at the same time, too many features had to be omitted and too much performance had to be sacrificed, so Jazz struck a discordant note.

Jazz might have managed to hang on long enough for a major revision had Excel not appeared. An independent developer had offered it to Microsoft, which saw that Excel was exactly what Lotus could — and should — have produced: 1-2-3's feature set with a terrific mouse-driven Mac interface.

Microsoft, which had appeared to be a sitting duck, released Excel even though it was virtually guaranteed to kill the sales of two of its two main Mac products, Multiplan and Chart, which were scarcely a year old.

On the other hand, because Excel seemed to have come out of nowhere, there was no long lead time (or frequent leaks) to warn Lotus of what was coming. In one of the most successful preemptive strikes of all time, Microsoft brought the powerful Excel to market just in time to take Jazz on head-to-head. It was no contest. Excel wiped out Jazz, Multiplan, and Chart in a single blow and established itself as the spreadsheet program to beat.

The release of Excel was a perfect case of having the right product at the right time. Had Excel been delayed by a few months, or had Jazz shipped on time in 1984, Lotus might have built up a strong enough lead to blunt Excel's impact. But the timing was perfect, and Jazz was history.

But that wasn't all. Excel was such a powerful, easy-to-use spreadsheet program that a Mac with Excel became more than a match for a PC with 1-2-3. Microsoft wasn't content just to best Lotus' Mac offering; it also shook its fist at 1-2-3 with its ability to read and write 1-2-3-compatible files.

The Mac became a true business computer in 1985, when the combination of the Laser-Writer and Excel made it capable of producing presentations and graphics that PC users could only dream about. Excel became a standard on a computer whose consistent interface discouraged application-level standards,

Savvy businesspeople began buying Macs just to get Excel, just as they used to buy PCs

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just to get 1-2-3. Microsoft also enjoyed some synergies: Excel users were often predisposed to pick Microsoft Word as their word-processing program. Excel and Word for the Mac became best-sellers for years.

To understand why Microsoft enjoys its current 90-percent market share in the Macintosh spreadsheet-program category, simply look at the attempts its competitors have made to counter Excel's success. In 1987 Lotus announced its "intention to announce" 1-2-3 for the Mac. This odd proclamation seemed to be an attempt to slow down the development of Microsoft Excel for the PC. At the same time, Lotus was working furiously on a major rewrite of Jazz, called Modern Jazz. Those who saw it were impressed, but Lotus mysteriously killed the project just before its 1988 release date.

Also in 1988, Ashton-Tate (which had finally seen the GUI light) released Full Impact, a spreadsheet program aimed directly at Excel users. "See why Excel doesn't" proclaimed the ads. Full Impact offered most of Excel's features, along with a superior interface and some innovative presentation aspects, including an integrated drawing environment and extensive formatting capabilities. However, Full Impact was quickly followed in 1989 by the much-ballyhooed WingZ, from Informix, whose long and elaborate promotional campaign (featuring Leonard Nimoy) stole Full Impact's thunder.

WingZ offered Excel-class power and ease of use. But Excel didn't have presentation capabilities per se, and WingZ provided sophisticated charting capabilities and a drawing environment similar to that of Full Impact. For example, WingZ simplified sideways printing, which is popular with spreadsheet users. Other nice touches included the ability to shade boxes and annotate text. (Such features were available for 1-2-3 on the PC through addin utilities from independent vendors.)

Equally important. WingZ featured a revolutionary scripting language that made Excel's macro language seem, well, clunky. This made it much easier to develop turnkey applications — something sophisticated corporate customers wanted.

Microsoft got lucky again, however, and long delays in shipping WingZ gave Microsoft an opportunity to give Excel a face-lift in the form of version 2.2 (because Microsoft had cornered most of the existing market, an important part of its strategy was to prevent switching).

The Shooting Starts

Going into 1991, Microsoft faced the same problem with Excel that Lotus faced on the IBM side: How to breathe new life into an aging product. Microsoft wasted no time in launching Excel 3.0, first for Windows and then for the Mac (see the Excel 3.0 review, July '91, page 56).

Excel 3.0 reenergizes and revitalizes an already excellent product. It offers major innovations such as style sheets and outlining, coupled with simpler enhancements such as improved charting and (finally) an icon bar.

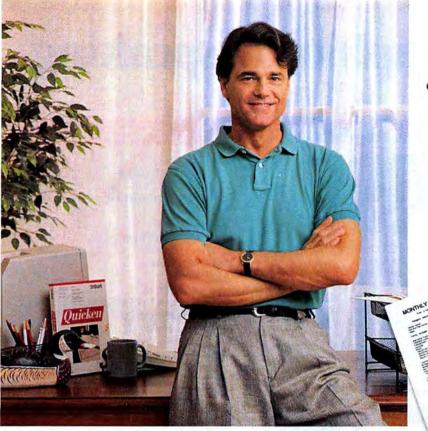
The coming months should be interesting for spreadsheet-program users. System 7.0 capabilities were built in to Excel 3.0, and a new version of Word should offer enhanced communication with Excel.

By the time you read this, Microsoft's old nemesis, Lotus, will have announced 1-2-3 for Windows and for the Macintosh. 1-2-3 for the Macintosh is much more than just a port of Lotus' DOS program (see New on the Menu in this issue for a description), but despite some innovative features, it's unlikely to convince large numbers of Excel users to abandon ship. That's not really Lotus' goal, though (especially considering how far Ashton-Tate and Informix got with that strategy). Expect Lotus to go after new Mac purchasers as well as after corporate accounts that standardized on 1-2-3 before there was a Macintosh.

Most importantly, no one will ever be able to tell you that you can't order a Mac because it won't run 1-2-3. This fact alone will put more Macs into corporate accounting departments than the evangelizing efforts of 100 Guy Kawasakis ever could.

Hot on 1-2-3's heels will be Claris' Resolve spreadsheet program, which has been in the works ever since Claris licensed some key technology (particularly the revolutionary scripting language I mentioned earlier) from Informix. Resolve will combine a slick user interface, which will look familiar to users of Claris' other applications, with deep System 7.0 exploitation (for more on Resolve, see New on the Menu, July '91, page 53).

Will Resolve and 1-2-3 make any more of a dent in Excel's market share than did the last two challengers, Full Impact and WingZ? Maybe, With the large number of Macs currently being sold to first-time buyers, there's never been a better time to find out.



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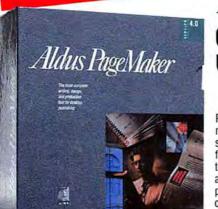
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Graphically speaking,



Aldus PageMaker 4.0

\$498

PageMaker 4.0 goes beyond the paste-board metaphor that made the original PageMaker a smash hit. New features include a blindingly fast Story Editor, extended support for color, the ability to rotate text, a built-in dictionary and spell checker. Files can be up to 9999 pages in length and multiple files can share a common index. You also get much more sophisticated type control with point-sized

dependent kerning on any text in increments of .01 point and a condense/expand range of 5% to 250%.

#03223 PageMaker 4.0\$498



Frame Technology FrameMaker

FrameMaker is the first software application that lets you simply and elegantly create long, structured,

multi-author documents on a Macintosh, without switching back and forth between other word processing and page layout programs. FrameMaker seamlessly integrates word processing, page layout, graphics, math equations and book building functions in one application. This is real workstation publishing software.

#03582 FrameMaker ...\$795

Brøderbund The Print Shop

The Print Shop makes it amazingly easy to create eye-catching stationery, greeting cards, letterheads, flyers, banners and other personalized communications. The program includes a wide variety of type styles, borders, background

wide variety of type styles, borders, background patterns, pictures and symbols. You can even pick up graphics that were created in MacPaint and transport them to your Print Shop designs.

#01015 Print Shop\$34



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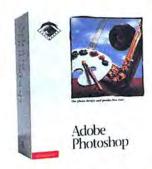
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MacroMind Director 3.0 is the multimedia presentation and animation tool that helps you communicate with greater impact . In version 3.0 Director is faster and easier for users to get the professional results they want. Movies and presentations sound , look and play better..

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Microtek 1850 Slide Scan

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applications. You can scan 24-bit color and 256 shades of gray at up to 1850 dpi resolution. It's versatile enough to scan slides in portrait and landscape modes.

#0370 ScanMaker 1850S \$2299

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It boasts outstanding color image quality and features a new, compact flatbed design.

#00369 ScanMaker 600ZS .\$1599





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#02678 Office\$519



Microsoft Excel 3.0

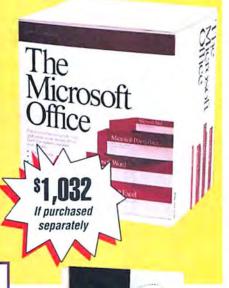
Microsoft Excel is the most advanced spreadsheet for

the Mac. It combines a spreadsheet with business graphics and data

Anima

management. It contains presentation tools such as multiple fonts, variable row heights, shading, custom number formats, 68 built-in chart types and more.

#00227 Excel 3.0 \$308



Touch BASE



TouchBASE is a database to keep track of all personal and business contacts. It's handy all the time because it is a desk accessory. It can print envelopes, labels, address books, fax cover sheets and reports.

#03908 TouchBASE \$88



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Claris Filemaker Pro

FileMaker Pro is the best selling flat file database for the Mac. New graphics tools streamline the generation of reports and layouts. You'll appreciate the new data entry aids: check boxes. radio buttons and pop-up menus.

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> The uses for LabelWriter are endless: you can print address labels, videocassette labels, disk or file labels. The palm size LabelWriter puts anything you can create with your Mac onto a 1" x 3-1/2" label. Our exclusive print driver software lets you print directly from your database, word processor or any other application, in vertical or horizontal format

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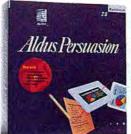
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#03769 WealthBuilder ... \$98

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Aldus Persuasion

Let Aldus Persuasion 2.0 do all the work of developing presentation graphics. Select one of the predefined templates (or create your own), and type your ideas

into the outliner. Persuasion automatically prepares your slides from the outline. You can use the slide show mode for your presentation or for a self-running demoor create overhead foils

#02424 Persuasion \$328

Meeting Maker

Meeting Maker makes it easy to get the right people in the right place at the right time. Select meeting participants, as well, as rooms, equipment and resources from a list of user names. Schedules your work

activities in advance, with Meeting Maker's easy-to-use calendar system. Prioritize and sort your activities with the built-in To-Do

#04009 Meeting Maker\$314





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languages under ISO-7 standards, plus userdefined character sets. It also supports large
screen monitors and color including color icons
and offers VT102 and BT52 emulation.

#01902 Microphone II \$214

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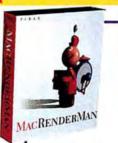


Dove Fax Plus DoveFax Plus offers the most sought-after fax software features such as: full background

Cutting Edge

as. Ini background operation, pre-scheduled transmissions, customized cover sheets and more! The DoveFax Desktop can be upgraded to the DoveFax Plus with the simple addition of a microphone and software.

#03514 Fax Plus\$395 #03318 Fax 24/96\$294





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#00030 Showplace\$548



MicroTouch Systems UnMouse

The UnMouse does everything a mouse can, only faster, easier and in less space. To move the cursor simply slide your finger over the glass surface. To make a selection, merely press down. The

U.S. Robotics

UnMouse also serves as an extended keyboard. With its one million touch points the UnMouse also doubles as a graphics tablet.

#03412 UnMouse \$180

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into a power workstation!
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Rival has 1024 x 826 resolution at a flicker-free 75 Hz refresh rate.

#04014 LC Monitor .. \$1199



Sigma PageView Monitor
The PageView GS

monitor supports 16 shades of gray at 640 x 870. 75 Hz refresh provides flicker-free display. Paper-white phosphor, tilf-swivel base, front panel on/off switch and more.

#03857 PageView \$850

Cutting Edge Removable Hard Drive They are not just for backup anymore! At 20 milli-seconds average access speed

this high performance drive is faster than most fixed drives When you need additional storage, simply add another cartridge. Performance, flexibility and security.

#03301 45 Mb Hard Drive \$589

Independently fused AC outlets, eliminating power surge damage, two EMI filtered AC outlets for single switch power up, a push button SCSI ID selector and a louvered chassis reducing noise levels by 50%





The new ultra compact Clipper from iDS delivers powerful storage capabilities and convenient portability in one tiny package. Weighing just 10 ozs, the Clipper fits easily into a briefcase and plugs directly into the back of any Macintosh computer via its unique pass-through SCSI port. The Clipper features full System 7 compatibility, automatic termination, a rugged 100g shock rating, a two year warranty and comes pre-formatted with SCSI Express Utilities and over 10 Mb of shareware software.

#00807

Clipper\$499

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01584 Mac 101E Keyboard -New 128 03326 Switchboard 158 **Keytronics** 02813 Mac Pro Kb 105 Plus Keyboard ... 144 Abaton Technology Corp 01507 Pro Point Adb (Se & Ii)79 Altra 02935 Felix116 Datadesk 03780 Switchboard Switch Track Ball 97 Kensington 01292 Trackball107 Microspeed 03306 Mactrac Trackball 512/Plus 60 03305 Mactrac Trackball ADB74 Micro Touch Systems 03412 Unmouse180 Mouse Systems Technologies 03629 Little Mouse A+ (512/Plus)74 03630 Little Mouse For ADB74 Advanced Gravis 02740 Mousestick Joystick 512 & Plus 64 Kraft 00941 Joystick Quickstick 512 & Plus 39 01990 Joystick (Premium III) ADB49



Turbo Mouse. Winner of the 1987, '88, and '89 Macworld World Class Awards for Best Input Device, Turbo Mouse is quicker, more precise and easier to use than any other mouse. Because the ball is on top, you move only the ball, not the whole

#01411 Turbo Mouse .\$104

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Utilities save you time MacZone saves you money



The Symantec Anti-Virus for Macintosh detects viruses by monitoring the suspicious activities that characterize them. The INIT portion acts like a watchdog during startup to detect viral activity. The CDEV portion operates during normal Mac usage and offers a number of options for checking disks and folders as you work. SAM has an Audit Trail to keep track of its activity and your responses.

#00116 S.A.M. 3.0\$66



Symantec Norton Utilities 1.01

Norton Utilities for the Mac gives you an unbeatable combination of disk and data recovery software, along with disk optimization utilities.

\$83

Now you can keep your valuable disks and data safe, secure and operating smoothly. It provides three levels of unerase, designed to give you optimal recovery options. The advanced diagnostic routines dig deep into the Mac operating system tool box to search for and recover lost data in minutes. With the Norton Utilities you can even unformat an accidentally-formatted hard disk. You also get Speed Disk, a powerful disk defragmenter and optimizer to significantly increase system performance by reducing data access time.

#03279 Norton Utilites \$83

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Review Copy



Strap on your moral beepers it's time for the Mac's greatest evangelist to start Selling the Dream. he editors of *MacUser* are usually reluctant to let someone write a book review when he or she knows the author well. But I got them to agree — just this once — to let me give it a whirl. . .

"Why don't you write a book about management?"

"Because I don't know anything about management."

"Then write about something you know."

"I only know evangelism."

"Then write about that."

"OK."

With this inauspicious beginning, Guy Kawasaki starts his latest book, Selling the Dream, from Harper/Collins. According to Kawasaki, Selling the Dream is supposed to "make you into a raging, inexorable thunder lizard of an evangelist." In the preface, he says, "This book is for people who want to make a difference. It is for flames, not embers. It is for people who want to challenge the status quo, the mediocre, or the mundane." So much for underpromising and overdelivering.

The author is eminently qualified (and he doesn't mind telling you so) to write about evangelism, In 1983 he became Apple's second software evangelist. The mission Steve Jobs gave him was to get "the best collection of software in the personal-computer business."

Kawasaki's job, along with that of Mike Boich (the first software evangelist and current chairman of Radius), was to cajole, coerce, and seduce software developers into creating Macintosh products. Apparently they were successful, because Macintosh has an outstanding collection of software today (as you can tell by the ratio of ads to editorial in each issue of MacUser.)

Like many businesspeople-turned-writers, Kawasaki looks back on his past business experiences and tries to bamboozle readers into believing that he knew what he was doing as he was doing it. Then he attempts to refine and reinterpret the lessons he learned in order to make a methodology out of them.

Evangelism Defined

Kawasaki begins by defining evangelism as "the process of selling a dream." It means transforming a vision — an insight not yet perceived by most people — into a cause. He argues that evangelism is the purest form of selling, because it involves sharing ideas, insights, and hope in contrast to exchanging goods or services for money. Kawasaki takes his first illustration from the computer industry. He discusses how Macintosh was a vision of improving people's creativity and productivity and how this vision was turned into a cause among Apple employees, software developers, and user-group members. Unlike in his *MacUser* column, where, according to some readers, he often discusses things he doesn't know about, Kawasaki is at home explaining the meaning of Macintosh.

As you would expect, Kawasaki takes a vicious swipe at IBM by pitting the PCjr's demise against the way the Macintosh has flourished, despite its lack of software, expandability, hard drives, and color:

"What accounts for the success of one flawed product (Macintosh) and the failure of another (the PCjr)? First, the PCjr was an intentionally crippled version of a powerful product, the IBM PC. IBM did not want the PCjr to cannibalize PC sales. By contrast, Macintosh was the first step in a new direction and the first step towards fulfilling a powerful dream. Which one would you buy?

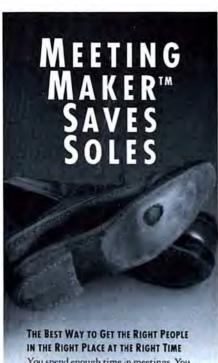
"Another reason for the failure of the PCjr is the way IBM sold it. IBM's status-quo formula was to put their label on it, spend lots of money to advertise it, and ram it down dealers' throats. IBM did not evangelize the PCjr — it sold a computer, but wanting to sell something is not evangelism."

After this diatribe, Kawasaki starts to provide meaningful information about evangelism. He says evangelism is founded on a cause, and causes do five things: embody a vision, make people perform better, generate big effects, catalyze selfless actions, and polarize people. Each of these points is illustrated with an example from either the business or the not-for-profit arenas.

Records, Birds, Ice Cream

The use of wide-ranging examples is one of Selling the Dream's strengths. This reviewer expected rehashed Macintosh and Apple examples, but he was relieved to find that Kawasaki was able to break away from the narrow confines of his previous work, The Macintosh Way. Organizations profiled include Windham Hill Records, the National Audubon Society, Ben and Jerry's Homemade Ice Cream, the Sierra Club, The Body Shop, and SeniorNet.

If a cause is the foundation of evangelism, then the building blocks are a leader, angels,



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GUY KAWASAKI

evangelists, and enemies. Kawasaki stresses the importance of the leader, who must believe and understand the vision, believe in people, set an inspiring example, and share the cause.

Unfortunately, his discussion of leaders, angels, evangelists, and enemies frequently borders on fiction. He describes what leaders should be, not what they are. One can imagine the naive Kawasaki conjuring up his ideal leader — vision from Steve Jobs, empathy from Bruce Nordstrom, earring from Jean-Louis Gassée, engineering from Ferdinand Porsche, and so on.

Tactical Evangelism

The rest of the book addresses tactical ways to evangelize products, companies, and ideas. This reviewer believes that the tactical material is Kawasaki's most important contribution to the ranks of salesand-marketing literature. He coverstactical topics such as writing business plans, making presentations, and recruiting and training people, along with tips and tricks for each stage of evangelism — sowing, cultivating, and harvesting.

Much of this material will be familiar to business-oriented readers. But Kawasaki performs a great service by boiling down whole books into chapters. (Perhaps he read a bunch of business books to get his ideas.)

Sex, Beepers, and PIPs

Kawasaki ends the book with two risky chapters: One is about evangelizing the opposite sex; the other is about the ethics of evangelism. This reviewer believes that a topic such as evangelizing the opposite sex has no place in a business book. One can only surmise that Kawasaki was short on page count and that his editor forced him to fill the book with such drivel.

Frankly, it's too bad Kawasaki didn't instead fill out the chapter on the ethics of evangelism. He puts forth the preposterous notion that most people wear what he calls a moral beeper. He believes that most people know when they are doing the wrong thing, so he only urges them to listen to that inner voice. To be fair, he does offer a way for people to "calibrate their beepers" so that they all go off at the same time.

Speaking of page count, Kawasaki includes the entire Macintosh Product Introduction Plan (PIP) in an appendix. This takes up about 100 pages of a 320-page book. The PIP, reprinted with Apple's

permission, is the plan that the Mac division created in 1983 to introduce the Mac. He cites the PIP as an example of a plan that combines fervor and zeal with business reality. Here is some of the hallucination-induced writing in the PIP:

"... Moreover, IBM will be using it's [sic] successful corporate positioning approach known as FUD to thwart Apple success in the worldwide business marketplace. FUD stands for Fear, Uncertainty, and Doubt. These are real competitive forces that can have greater influence on the purchasing decisions than product characteristics. Yet when weighing the competitive strengths of Apple and IBM we win in one key category: PRODUCT SUPERIORITY."

Although the PIP may be fascinating to Macintosh aficionados and people writing business plans, this reviewer questions increasing the page count with a large appendix.

Lack of Originality

Perhaps from force of habit, or because hedidn'thave freshideas, Kawasaki copied much of *The Macintosh Way*'s style — he uses footnotes and exercises in sometimes funny but often distracting ways. This reviewer comes from the old school of writing, which dictates that footnotes are supposed to help readers. In *Selling the Dream*, the footnotes sometimes entertain, sometimes confound. For example, one footnote says: "Most people think that MS-DOS stands for Microsoft Disk Operating System. It really stands for Microsoft Seeks Domination of Society."

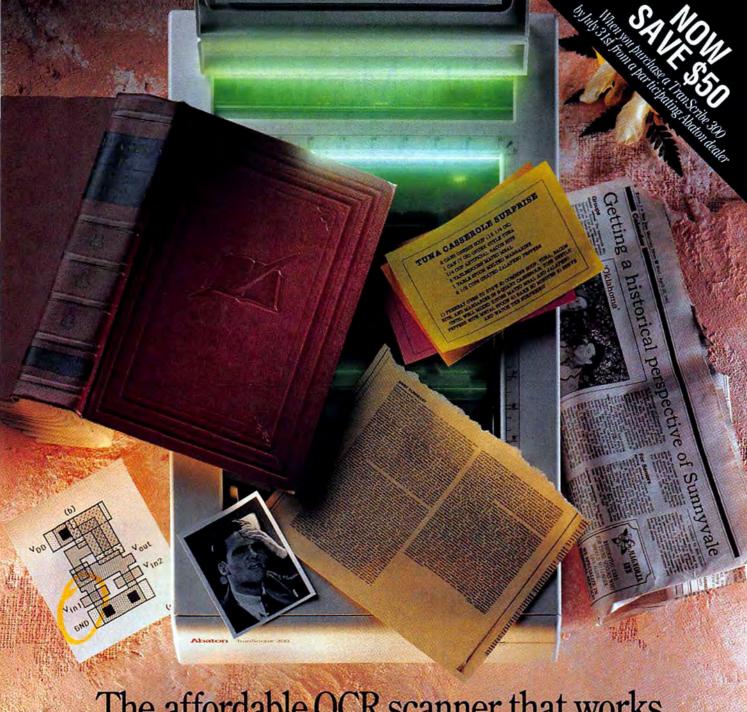
And one exercise instructs you to "Pick the best answer. Vision is to cause as

- a. BMWs are to yuppies.
- b. Shoes are to Imelda Marcos.
- c. Love is to marriage.
- d. Money is to divorce."

Kawasaki introduces one new concept: rules of thumb. I suspect, however, that he wasn't clever enough to think of this himself but was inspired by Tom Parker's Rules of Thumb book. Here's an example: "People never buy a computer that is more friendly than they are."

Selling the Dream is a useful and entertaining book for people trying to make a product, company, or idea successful. Kawasaki combines interesting examples, vicious humor, and some sparkling insights. The book is not perfect, but it is certainly worth \$19.95. And Kawasaki makes \$3 per copy.

Beep. Beep. Beep.



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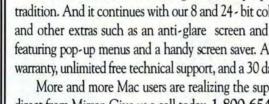
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America's Home Video



When personal computers and video unite, the result could be a little wild at heart.

icholas Negroponte is the Marshall McLuhan of the technosavvy '90s: He understands media. For years, from various podia around the world, this founder and director of MIT's Media Lab has been predicting the coming marriage of television (video, that is) and computers. As the nuptials draw near, the computer industry is abuzz.

Apple Computer, for example, has recently been abuzz demonstrating to developers its impressive software-only approach to video compression at conferences with *multimedia* in their names. Other topics get discussed at these conferences, but video is the key to the hope chest of multimedia.

Fortunately, you've read last month's Mac-User Lab report on video, so you know all about getting video into and out of the Mac. What you still may wonder about, however, is what this in-and-out's about. What will be the product of this computer/video marriage? When this union is blessed with issue, which parent will it favor?

I predict that the technology of the offspring will resemble computer technology — especially the technology of the Mac — but that its content will look more like video.

This sort of phenotypic prognostication is highly speculative but fun. In this light, I'd like to make the following wild guesses about the kid's character: (1) The computer applications that drive the acceptance of computer video won't be like the applications that have driven past computer innovations; (2) although the new thing will look like video, it will redefine what video looks like — perhaps in the direction of HDTV's high-resolution, wide-screen format; (3) the players in this game won't be the same ones we already know; and (4) our nice, civilized computer industry is going to become a little wild at heart.

I have reason to believe that the applications driving the acceptance of computer video will be entertaining or educational rather than productivity-enhancing and that they will be used at home rather than in the office. I also have reason to believe that the entire focus of innovation and investment in the computer industry may shift in this decade to products designed for home use.

If computer-industry columnists were held accountable for their guesses, several careers would have foundered on the rocks of the home market that wasn't (and kept on not being). Unaccountably, they are not, and their hit rate matches that of the IBM marketing

executives who regularly leap into the home waters, not noticing that somebody has failed to fill the customer pool. Of IBM's many forays into the home market, the notorious Prodigy service is its most successful to date.

Nevertheless, it may very well be that the home market's time has finally come. One reason is that Apple is spending serious money in ways consistent with these guesses, and Apple doesn't have as much money to waste as IBM. Apple now has a consumer-products division that will, reliable guessers guess, start selling within the year, through consumer-electronics channels and at three-figure prices, machines designed for the home and for home applications.

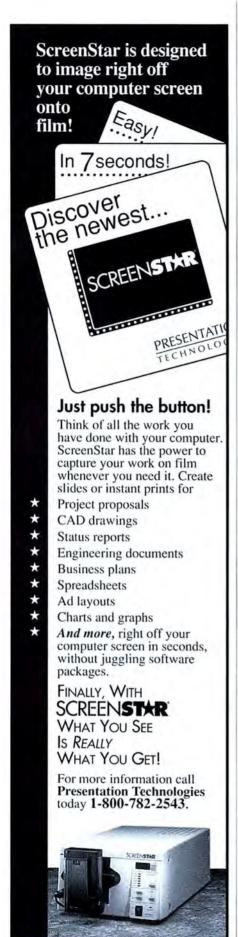
A good first guess at what such machines will look like is already in the stores. Like a CD player or VCR, Commodore's CDTV sits on a shelf in the living room or media room and is controlled by an infrared remote control. It's more flexible than those other appliances, though. In addition to playing audio CDs, it can also handle CDs with audio plus still images or MIDI and can provide interactive control over CD-ROMs. The CDTV is really a computer in disguise, which becomes obvious if you add the optional keyboard and disk drive.

Expect Apple's home machine to resemble Commodore's; to attach to a TV; to include a built-in CD-ROM drive; and on close examination, to be revealed as a low-end Mac in disguise.

These devices are not yet the new thing that the marriage of TV and the computer portends, but as the standards and technologies for digital video emerge over the coming months, Apple's and Commodore's machines should be positioned well to take advantage of them.

There's another reason to think that home is where the market is: Video is such a greedy medium. It eats a lot of processing power, memory, and storage. If it is to be anything more than a specialty item for affluent computer users, video-ready computer hardware will need the economies of scale of a large customer base. I don't think that the products that deliver that customer base will be produced by the companies listed in this month's *MacUser* advertiser index.

Entertainment products — TV programs and movies — justify a huge video-based industry whose primary market is the home. Hence my guess that the applications that drive the computer/video connection won't be tools



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MICHAEL SWAINE

I have reason to believe that the focus of innovation and investment in the computer industry may shift in this decade to home products.

for producing better presentations at board meetings but rather entertainment (or to a lesser extent educational) products for the home.

The machines that will run these home products don't exist yet, so the computer/video marriage won't be bearing fruit immediately. But if the standards and the technologies come together, the combined market for this sort of home hardware and software may grow faster than any sane person can predict.

The reason I think that the new market could be so explosive is because I've seen the demos. And although they look like video, these new video applications redefine what video looks like. It'll be interactive, for one thing, but the key is that it will be digital.

"It's almost a final decision now that the United States will go to a digital system for HDTV," says Nick Negroponte, and he sees several consequences of this.

Digital signals can be compressed. So "when the phone company puts in its fiber base, you can deliver one hour of video in five seconds to anybody in the United States." Video will change from something that pours out of a spigot to something we download for viewing at our convenience.

There are better things to do with HDTV's increased bandwidth than just marginally improving picture quality, Negroponte says. Such as providing depth of information. Say you're watching a news story. Press the tell-me-more button on your remote control, and you get a background story on the same subject as the news story being shown.

Extra bandwidth can also be used for scalable video. Rather than thinking of TV images in terms of scan lines per picture, think in terms of scan lines per inch, as with a printer. As Negroponte sees it, a video-transmission system that gives us a picture "that can be seen at any resolution and is scan-line-independent, frame-rate-independent, and aspect-ratio-

independent has got to be the right way to go, and only digital can do it."

Beast of Burden

Apple seems to understand the rules and is prepared to play the home game. Other familiar players haven't anted up yet. Microsoft doesn't seem to recognize the importance of digital video and may consequently lose big.

For that matter, we may be coming to the end of the era in which hardware and operating-system vendors have much to say about what we use the machines for. Entertainment providers are experienced in delivering video content. They will probably become the primary content providers for this yet-unborn industry. If so, they will be the primary vendors in what will certainly become the dominant segment of that industry.

In fact, movie and entertainment companies are buying into other segments of the industry. They're buying or investing in or forming strategic alliances with hardware companies. This is arguably not to their advantage, but the entertainment companies may not see it that way. They may see owning the delivery technology as the only way to get a grip on medium madness. Assuming the burden of complexity, as it were.

America's Digital Home Videos

But if the content will be entertainment (and education) and the content providers entertainment (and education) people, that still doesn't answer the question of what specific content will make it all pay off.

My guess is sex.

It worked for VCRs: Cheaply and quickly produced X-rated videos gave the new videocassette-rental business the inventory and profit margins it needed to get off the ground. It's probably helping bring down prices of video cameras, although we'll have to wait for some Kinsey of the '90s to tell us what proportion of home videos are amateur sex videos.

Perhaps the sexual content of the new video will be of more than prurient interest. Interactive sex videos may aid sex therapy, and interactivity may inspire artistic content developers to create a whole new genre of erotic fine art. But I bet that cheaply and quickly produced X-rated products will give the largest economic boost to this new industry. A genre in which production quality and artistic merit appear superfluous can put a lot of product into the pipeline awfully quickly.



Some.

Why settle for an incomplete set of utilities when you can have them all? Presenting MacTools® Deluxe-the most comprehensive, powerful collection ever assembled for the Macintosh.

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Conspicuous consumption: If the 1.4-megabyte floppy disk has started cramping your style, buck up - the 4-megabyte floppy disk is on the way. TDK announced that its first barium ferrite floppy disks would hit the market in early June. Of course, there aren't any 4-megabyte Mac floppy-disk drives yet, and it's a good thing: TDK suggests a list price of \$15 per floppy! Buck up indeed.

By Russell Ito

Small packages: The envelope has kept the electric typewriter alive — for now. Envelope printers started out as niche products, but the market has heated up.
☐ CoStar([800]426-7827) launched things with its LabelWriter(see review,

May '90, page 57) and then followed up with the AddressWriter (see New on the Menu, April '91, page 51) for production envelope addressing. Now CoStar has teamed up with Avery ([800] 541-5507) to introduce the LabelWriter's successor. Both companies are distributing the same thermal printer but with different names, software, and prices. CoStar's LabelWriter II (\$249.95)



and Avery's Personal Label Printer (\$279.95) are 137-dpi (compared with the LabelWriter's 72-dpi) units that connect to the computer via the modem port or the printer port. The printers come with a 1-inch print head that can print a standard 1-x-3-inch label in 3.5 seconds. The head is supposed to last through one kilometer's worth of labels. Users can upgrade CoStar's LabelWriter II by replacing the 1-inch print head with a 2.25-inch print head. CoStar also sells the printer as the LabelWriter II Plus; a LabelWriter II configured with the wider head, it costs \$399. Both companies bundle addressing software: CoStar, a version of MacEnvelope; Avery, MacLabel Pro.



labelless envelopes, Tidemark ([800] 338-8552) has introduced the Address Express printer, a 192-dpi inkjet unit. The printer comes with some slick software that automatically "reads" the address from your letters, places it into a layout you've designed, and prints your envelope — after just one command. At \$1,195, the

Address Express is intended as a networked device, but unfortunately Tidemark doesn't offer an AppleTalk option: You must connect the Address Express via a network modem or by using a Mac as a "soft server."

The typewriter-free office may be just around the corner.

Up to Date . . .

Photoshop, Adobe's image-manipulation package, has seen its first major upgrade. Version 2.0 boasts direct CMYK editing; duotone, tritone, and quadtone editing; and the ability to import Adobe Illustrator files. (415) 961-4400. \$895.

Retrospect, Dantz Development's archiving utility, is now in version 1.3 and is System 7.0-compatible. The archive size limit is 1 terabyte (1,000 gigabytes). (415) 849-0295. \$249.

TopDown, Kaetron Software's flowcharting package, is now in version 3.0. Enhancements include more connecting-line choices and automatic symbol resizing to accommodate text. (713) 890-3434. \$345.

■



The PhaserJet PXi is a 300-dpi, plainpaper, color, PostScript Level 2 printer that uses a wax-jet technology for printouts as large as tabloid size.

Plain-Paper Color

Most color printers have the same basic problems: They're expensive, they often require special paper, and their color rendering is usually less than ideal, but Tektronix's PhaserJet PXi may change that.

The PhaserJet PXi is the first plainpaper color printer that can print on tabloid-sized (up to 12 x 18 inch) paper and costs less than \$10,000. A RISC-based 300-dpi unit, the PhaserJet PXi is also one of the first PostScript Level 2 printers.

The unit's print engine uses a process Tektronix calls "phase change ink-jet technology." The PhaserJet PXi melts solid wax-based inks and squirts them onto paper (it's sort of a crayon-jet). The liquid wax cools and bonds to the paper, and the printer fuses the wax to the page by

squeezing the print under 3,000 pounds per square inch without heat. This process secures the wax bond and smooths out any bumps.

Designed for networked environments, the PhaserJet PXi has parallel, serial, and AppleTalk ports with automatic switching. Tektronix has also included HPGL emulation for applications that don't support PostScript.

The PhaserJet PXi should be available by the time you read this.

Tektronix, Inc., P.O. Box 1000, MS-63-583, Wilsonville, OR 97070; (800) 835-6100, \$9,995.

At Long Last Lotus

It's been a long time coming, but Lotus 1-2-3 is coming to the Mac — really.

Lotus 1-2-3 for Macintosh combines a Mac interface with all the features DOS 1-2-3 users have come to expect. For example, Lotus' unique 3-D spreadsheet design, which lets users have up to 256 worksheets in a single file or 256 single worksheet files, is supported. The maximum spreadsheet size is 256 columns by 8,192 rows. And as expected, the Mac version is fully compatible with its DOS counterparts. It can also read and write 1-2-3 macros directly, so DOS users who have constructed highly automated 1-2-3 worksheets can run their macros without modification in the Mac version. Users concerned about Excel connectivity can breathe easy, because 1-2-3 can read and write Excel 2.2 files and macros.

But 1-2-3 for the Mac offers more than just its connectivity advantages. It's the

only Mac spreadsheet program that lets users enter and edit data directly in a cell—instead of in the familiar formula bar. Tear-off menus are available, and the formula bar and palettes are floating objects that can be positioned anywhere on-screen.

Lotus 1-2-3's presentation capabilities include a variety of chart types — including 3-D — plus a drawing layer with graphics tools. There's also a button tool for creating buttons on the drawing layer that can launch macros. The program also offers custom graph templates.

For power users, 1-2-3 offers Backsolver, an analysis tool for deriving a value for a variable in a formula by working backward from the formula's result. There's also DAL support under System 7.0 for access to database programs such as Oracle, Sybase, Ingres, and DB2.

You can expect 1-2-3 for the Macintosh to appear this fall.

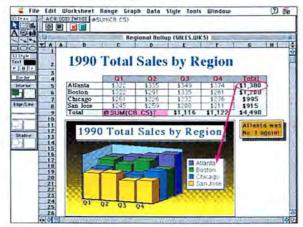
Lotus Development Corp., 55 Cambridge Parkway, Cambridge, MA 02142; (617) 577-8500. \$495.

DeltaGraph Goes Professional

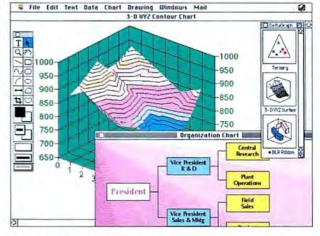
Moving up the evolutionary ladder, DeltaPoint, developer of the DeltaGraph graphing package, has taken a step toward the scientific and engineering community with DeltaGraph Professional.

System 7.0-friendly, DeltaGraph Professional supports publish-and-subscribe and Apple events. Under System 7.0, it can share data with a program such as Excel 3.0, serving as a specialized charting engine for spreadsheets.

DeltaGraph Professional features



Lotus 1-2-3 for Macintosh is compatible with Excel 2.2 and all other versions of 1-2-3. It makes extensive use of floating windows, including the formula bar and palettes.



DeltaGraph Professional is an enhanced charting package that should appeal to scientific users and business presenters.



CoStar's Stingray trackball boasts a radically different design. Its profile is nearly identical to that of an Apple mouse.

several new chart types, including a range of technical charts (3-D surface, XYZ surface, contour, and ternary) and a variety of business and presentation charts (bubble, picture, and multiple pie). The program also offers text charts, including bullet and organization charts.

The package now includes a slide-show function, complete with sound integration, for presentations, and it also supports graphics libraries. Entire charts — including graphic objects that were drawn and added to the chart, such as company logos — can be saved as libraries, which makes creating consistent charts easier.

Users who don't need the specialized charts included in DeltaGraph Professional can opt for DeltaGraph 2.0, which offers most of DeltaGraph Professional's features but without the technical-chart types and slide-show function. Expect to see both programs this summer.

DeltaPoint, Two Harris Court, Suite B-1, Monterey, CA 93940; (408) 648-4000. DeltaGraph Professional, \$295; Delta-Graph 2.0, \$195.

Rolling Out the Stingray

Ever since the first Kensington TurboMouse, trackballs have been pretty much the same. Almost all of them have a billiard ball set in a large platform. But CoStar has now introduced a radically new trackball design: the Stingray.

The Stingray comes in matte black or platinum, and it has a smaller footprint than most of its competition. It's no taller than a standard mouse, and the extra-large buttons on either side of the ball make it easy to use regardless of how your hand rests on the unit. The ball is small and light, and the base includes a short integral cord for connecting to a keyboard without any wasted cable. A switch on the bottom of the unit lets you set either of the buttons to click-lock, but this mode seems unneeded

in view of the Stringray's lack of chording options.

CoStar Corp., 22 Bridge Street, Greenwich, CT 06830; (800) 426-7827. \$129.

GCC: PostScript for \$1,599

If you think buying a PostScript printer will break your budget, think again. GCC Technologies has broken new ground with the latest addition to its BLP line of printers: the BLP Elite.

The BLP Elite has a list price of \$1,599, and it features Adobe PostScript. Built on a 300-dpi, 4-ppm engine, the BLP Elite uses a 16.67-megahertz 68000 microprocessor that, according to GCC, makes the BLP's page-processing speed up to 40 percent faster than that of Apple's Personal LaserWriter NT, whose list price is \$1,000 more. The BLP Elite comes standard with 17 PostScript fonts, 2 megabytes of RAM, and a LocalTalk port.

And for users who bought GCC's earlier QuickDraw printer, the PLP II, the company is offering a \$799 PostScript upgrade that turns the PLP II into a BLP Elite.

GCC Technologies, 580 Winter Street, Waltham, MA 02154; (800) 422-7777. \$1,599.



GCC Technology's BLP Elite costs less than \$1,600. Its controller board is less than half the size of Apple's comparable Personal LaserWriter NT motherboard.

NewsLine

Reports and Analysis

Apple Cuts Staff

CUPERTINO, CA — Responding to the drop in gross profit margins that drove its stock down earlier this year, Apple Computer has announced plans to reduce its work force by 10 percent by the end of the third fiscal quarter ending June 28. The layoffs may affect 1,500 employees in all job classifications. This is the fourth and largest layoff in Apple's history.

Apple Slashes Upgrade/RAM Prices

CUPERTINO, CA — Apple Computer has slashed its prices for motherboard upgrades and RAM. The price cuts on the motherboard upgrades range from 13 percent (upgrading a Mac II to a IIfx now costs \$2,599) to 41 percent (upgrading an SE to an SE/30 now costs \$999). Although the RAM prices have been reduced by as much as 58 percent, the revised prices are still substantially higher than those charged by most third-party vendors.

Apple Adds Windows 3.0 to Suit

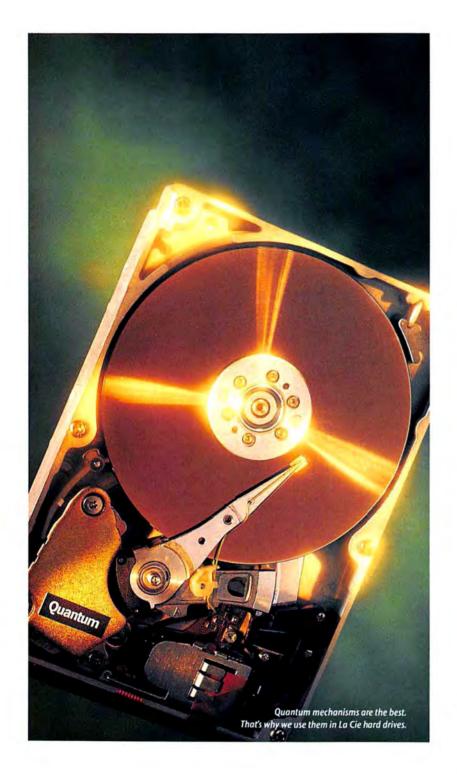
REDMOND, WA — Taking a step that many observers had expected for some time, Apple Computer has announced plans to explicitly include Windows 3.0 in its continuing look-and-feel lawsuit against Microsoft and Hewlett-Packard. Apple's argument stems from the company's contention that Windows 3.0 is a derivative of Windows 2.03, which has always been at the center of the suit. The case is expected to go to trial sometime this summer.

Judge Overturns dBASE
Ruling

LOS ANGELES, CA — Reversing his December 1990 ruling that Ashton-Tate's copyrights on dBASE were invalid, U.S. District Court Judge Terry J. Hatter reinstated the company's copyrights before Ashton-Tate's appeal could be heard in the Ninth Circuit Court of Appeals. Although the copyrights have now been restored, Ashton-Tate's 1988 copyright-infringement suit against Fox Software and The Santa Cruz Operation continues.

HP Chops DeskWriter Price

PALO ALTO, CA — Responding to the intense price competition from Apple's StyleWriter printer, Hewlett-Packard has cut the price of its DeskWriter inkjet printer to \$729. The street price is less than \$500.



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And, Silverlining drivers are intelligent. They test the drives' functionality at startup to ensure that everything is working properly. If it's not, it protects you.

For even more protection, every La Cie drive includes a FREE copy of Norton Utilities* for the Macintosh. It automatically diagnoses, reports and repairs common and dangerous disk problems. Silverlining and Norton Utilities are regularly priced at \$149 each. So, you get software worth almost \$300—ABSOLUTELY FREE— when you buy a La Cie drive!

3

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MULTIMEDIA

Authorware Professional

Eddy-Award winner Authorware Professional is a supremely engineered tool for building interactive training applications without programming.

Authorware Professional is an ambitiously conceived and smoothly executed construction set for building interactive training applications without writing code. The \$8,000 package develops sophisticated multimedia applications — including the incorporation of sound, video, and animation — from start to finish.

Go with the Flow Line

You construct Authorware applications by stringing together icons that represent various program components. Authorware's iconic programming system is thoughtfully designed. Authorware uses a flow line (a variation on the flowchart diagram) to construct programs. The idea behind the flow line is simple: You grab icons from a palette, drop them onto the flow line, and then click on the icons to bring up the dialog boxes, tool palettes, and menu choices that let you program each icon to suit your needs. Several subtle design decisions make Authorware's flow-line approach more than just an electronic flowchart and give it advantages over other iconic approaches. Most importantly, while letting you develop programs of arbitrary complexity, the linear approach virtually guarantees

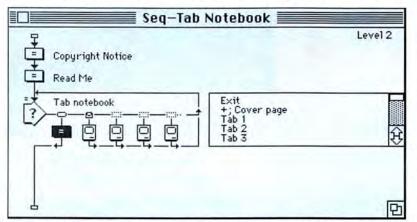
that what you see at any level of the design process is a meaningful chunk of your program. That's because the flow line is a line rather than a branching flowchart. With Authorware, you can create branches from the line, but branches are indicated rather than drawn out.

Other beneficial constraints include limiting the number of icons that can be attached to flow lines and fixing the size of windows in which flow lines appear. These constraints force modularity onto the design process, a real plus because at any level of the program, you're viewing the exact amount of detail required to understand that level.

Icon-Driven

Authorware Professional uses fewer than a dozen icon types, most of which determine the nature of the information presented to users: Display icons put text or graphics on-screen, Animation icons move objects, Erase icons remove displayed objects, Movie and Sound icons control the playback of prerecorded movie and sound sequences, Video icons control external videodisc players, and Wait icons interrupt the execution of programs.

Other icon types determine the flow of



Authorware Professional makes development of even the most complex interactive applications manageable. You create applications by using a sequence of icons on a vertical flow line. Labels on the icons become documentation for the program.

the program. For example, Interaction icons present options or questions to the user, branch to other icons based on the response, and provide feedback to the users.

Limiting the number of icons is a strategic constraint that actually enhances Authorware's usability. If you know what functions the program's few icons represent, you know how to use the product.

Once you've placed icons onto the flow line, you're ready to activate them. Click on a Display icon, for example, and the program brings up an empty, resizable presentation window and a palette of drawing tools for creating graphics or blocks of text.

Authorware's graphics capabilities are rich. They include transparent versus opaque overlay modes, visual effects such as fades and zooms, and 24-bit-color support. Bit maps and PICTs can be imported. Text font, style, size, and color can be set on a character-by-character basis, and margins and justification must be set on a per-object basis, although only two kinds of tabs are supplied.

You can build a simple application just by stringing together Display icons interspersed with several Wait, Erase, and Animation icons. But to make the application interesting, you need to introduce some branching by using the Interaction icon.

The Interaction icon is a right-pointing arrow. When you drop it onto the flow line, you attach other icons to it that supply alternative actions based on user input. You can make interactions available for a specified time only, as when you are presenting a sequence of questions to a student. But Authorware also allows interactions to sit in the background, ready to respond (which is how you might implement a help button, for example).

After you string together eight or ten icons, you have a mildly complicated application. You also have a full flow line, and that's where the Map icon comes in. Authorware lets you group any sequence of icons and replace them with a labeled Map icon. The Map icon then becomes a module of your program, and clicking on it opens a separate window with its own flow line and icons — a convenient way to modularize an application.

Calculating Design

A Calculation icon provides a window for entering expressions that will be evaluated whenever the application encounters the Calculation icon. So, for example, you can set the application to measure subject-matter mastery based on user responses and to display this and other calculated data to users in table, report, or graph form. Although Authorware has no dedicated graphing capabilities, calculated values are available to line and circle functions, making it easy to produce simple graphics based on computed values. And although Authorware is not a database program, there are facilities for building, saving, retrieving, and using an array of data.

You can use your calculations with any of Authorware's 200 system variables or functions and also with any variables, commands, or functions you supply. If you supply functions, they must be in the form of external commands or functions (XCMDs or XFCNs). Here, real programming is required, but fortunately a lot of XCMDs and XFCNs are already written. Most XCMDs and XFCNs written for HyperCard or MacroMind Director, for example, probably work with Authorware Professional.

Using XCMDs and XFCNs is one way to speed up your Authorware program. A better way is careful design. Some features — such as the background option in interactions — will slow your program down if overused, but on a Mac II we found the speed acceptable across a variety of Authorware applications.

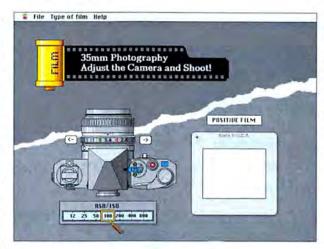
As you design programs, you'll want to try them out. Authorware excels here. You can jump quickly from the design phase to the test phase and back again. Or you can test the whole program, a single icon, or any segment of the flow line.

Once your design is complete, you can document the application, using Authorware's ability to create detailed printed reports. And finally, Authorware lets you package applications so that users can run them without the Authorware program.

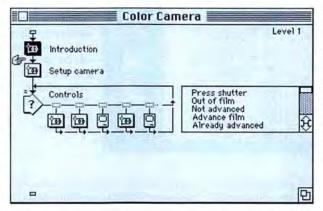
The program's multimedia capabilities include a sound digitizer; sound-editing software; the ability to import AIFF, PCM, and snd sound formats; and control over playback speed.

Animation capabilities include tools for designing animations, support for layered animations (so one object can pass in front of another), and the ability to import PICS animations.

Video support extends to a large and growing number of videodisc controllers. A productivity library supplied with the



Authorware lets
you create various
modes of user
interaction with
your training
applications. Here,
the user can click
on various parts of
the camera or
make menu
selections.



Much of the intelligence of an Authorware program resides in the icons. The program shown here controls the photography tutorial illustrated in the "35mm Photography" figure above.

package contains sample movies, sounds, and models (subprograms that can be shared among Authorware programs.)

Authorware is a rich development environment that requires four manuals to document it. Fortunately, Authorware, Inc., also provides free hands-on training with the product.

To take full advantage of all of Authorware's features, you should have a minimum system configuration of an SE with 2.5 megabytes or of a Macintosh II with 4 megabytes for development of color applications. However, you can run Authorware on a Macintosh Plus with System 6.0 or later and 1 megabyte of memory.

The Bottom Line

Authorware Professional is a unique and powerful development environment for creating interactive courseware and training applications. By using its iconbased programming techniques, developers can build applications quickly and easily without writing code. Authorware is designed to handle all aspects of multimedia-application development.

Moreover, although other development tools offer object-oriented approaches to programming, none can match Authorware's elegant and well-conceived design. Through its use of constraints and a simple, always visible flow line, Authorware Professional makes the development of even the most complex applications manageable.

- Michael Swaine

Get Info

Authorware Professional

Published by: Authorware, Inc., 8500 Normandale Lake Blvd., Suite 1050, Minneapolis, MN 55437; (612) 921-8555.

Version: 1.6.

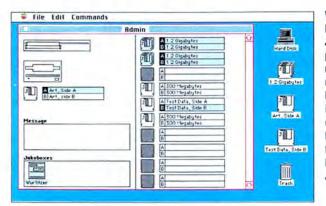
List Price: \$8,000; for educa-

tional users, \$995.

MASS STORAGE

Pinnacle Micro REO-6500 and PLI Jukebox Junior

For those who've outgrown their hard disk, optical jukeboxes are a high-capacity, cost-effective mass-storage alternative.



With the Pinnacle Micro REO-6500's Jukebox Admin program, you can use the mouse to move optical discs between slots and into the jukebox's optical drive, a handy software feature that the PLI Jukebox Junior lacks.

You can spend thousands of dollars on a hard-disk drive that stores a gigabyte of data (see "Gigadrives: The 1,000-Megabyte Solution," July '91, page 140). That's bad enough, but when it comes to multiple-gigabyte storage, massive hard drives can't offer a cost-effective solution. Enter the optical jukebox, a storage solution for the desktop or file server that's capacity-intensive, secure, and cost-effective.

Put Another Nickel in the Jukebox

Pinnacle Micro and PLI both offer optical jukeboxes based on hardware from International Data Engineering. At the high end, both vendors offer a 36-gigabyte jukebox, but we looked at the smaller, 6-gigabyte, ten-disc versions: the Pinnacle Micro REO-6500 and the PLI Jukebox Junior. Each device contains a single magneto-optical erasable drive and costs about \$13,000. The cost breaks down to roughly \$10,000 for the jukebox, \$2,000 for the ten optical discs, and \$1,000 for the software.

Although optical jukeboxes are slower than hard-disk drives, they're more secure, because they're impervious to the magnetic fields that can harm data on hard disks. Like musical jukeboxes, optical devices find the "records" (erasable optical discs or WORM discs) that contain the requested files, move them to a player (the optical drive), and insert them with either side A or side B up.

Both the Pinnacle and the PLI jukeboxes use at least two SCSI addresses: one for the optical drive and one for the diskchanger controller board. You can daisychain up to three jukeboxes from one Mac. PLI also offers a version with a built-in hard drive whose disk acts as a cache, but it requires a third SCSI port. The Pinnacle jukebox also has a disk cache, but it uses a portion of your hard drive. In either case, the purpose of the hard-disk cache is to prevent the jukebox from swapping discs every time you open an application.

The jukeboxes have two important features in common. The first is the ability to create spanned volumes where multiple discs appear and act as a single volume on the desktop. The other key feature is the software that arranges the discs within the jukebox.

Pinnacle Micro REO-6500

Version 2.0 of Jukebox Admin, Pinnacle's disk-handling utility, allows you to graphically view and manipulate the inside of the jukebox, modifying the arrangement of discs in their slots. For example, you can insert any jukebox disc into the device's internal drive simply by dragging the disc icon to the drive icon. Similarly, you can swap the position of a disc by dragging the disc icon to a numbered slot or remove a disc from the jukebox by dragging the disc icon to the Export icon.

Although there is only one drive in the jukebox, the REO-6500 lets you mount more than one disc on the desktop. You can mount spanned discs or a single side of a disc by clicking on the appropriate icon(s) in Jukebox Admin and choosing Mount. Mounted jukebox discs all appear on the desktop as if they were in the drive; they're not grayed out.

Spanning discs is also easy and versatile with Jukebox Admin, which lets you combine discs into a single volume of up to 2 gigabytes. You can mix spanned and single discs in the same jukebox, and the Unspan command returns discs to individual volumes.

By keeping track of mounted volumes and their contents with file pointers, the REO-6500's hard-disk cache keeps the jukebox from continually inserting discs into the drive (it takes about 30 seconds to swap discs) as you switch applications. Once a program has been launched, it's stored in the cache the REO-6500 creates on your hard disk. The REO-6500's cache can be from 4 megabytes to 256 megabytes, but the company recommends 40 megabytes. The cache is set up in a control panel, and it's important to make sure the cache is on. Otherwise, the drive will go through every disc each time you open and quit an application (such as AppleShare) that looks at volumes.

The jukebox runs very well once you have an application running (see the "Optical-Jukebox Performance" figure), but the REO-6500 generally requires more disc swaps than the PLI Jukebox. For example, you must wait for a disc to swap the first time you open a volume. More annoying but less frequent is the REO-6500's startup procedure, which inserts every side of every disc into the drive when the Mac is booted. This can take about eight minutes for a ten-disc jukebox connected to a IIci.

PLI Jukebox Junior

An advantage of the PLI Jukebox Junior is that it breaks the Finder's 2gigabyte limit for mounted volumes; this



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Contact QMS for availability of network options

*Patent pending

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NEW ON THE MENU REVIEWS



The PLI Jukebox Junior (right) holds ten erasable optical discs, for a total formatted storage capacity of 6 gigabytes. The Jukebox Junior and the Pinnacle Micro REO-6500 (left) use the same jukebox mechanism, from IDE.

lets you span seven optical discs to create a 4-gigabyte volume. And unlike the REO-6500, with its caching scheme, the Jukebox Junior has a built-in 40-megabyte hard drive that won't be affected if your Mac is busy with other tasks.

Another PLI advantage is that there is no disc swapping on startup, because the hard-disk cache is set up automatically, saving you the time of waiting for disc swaps before you can turn the cache on. Shutting down takes about 15 minutes on a IIci, because the software automatically backs up the cache to an optical disc on shutdown. With spanned discs, we found the Jukebox Junior's performance to be slower than that of the REO-6500 (as long

as no other tasks were competing with the REO-6500 for hard-disk access).

The Junior Jukebox Manager software is the weakest aspect of the Jukebox Junior. Version 1.0 of the software lacks the sophisticated administration features of the REO-6500. There is no way to see which discs are spanned after you've formatted them, for example, and you can't shuffle discs around in the jukebox.

The jukebox can contain either spanned volumes or single volumes, but not both. PLI claims that it will provide this capability with a future version. For now, if you have spanned volumes, you can't choose which discs to remove from the drive — you can only choose to remove them all.

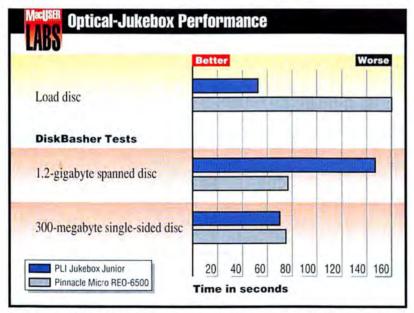
In addition, Junior Jukebox Managercan't format single discs in standard, non-spanning format, although you can import preformatted single cartridges. Another inconvenience stems from the modal nature of the software. You can't switch out of it in MultiFinder unless you quit the program.

The Bottom Line

Optical jukeboxes are a viable, costeffective alternative to hard-disk drives if
your storage needs surpass the 1-gigabyte
mark. We encountered no problems when
using either the PLI or Pinnacle product
with an AppleShare file server or on a
stand-alone Mac. Overall, with its superior disc-management software and performance, the Pinnacle Micro REO-6500
is the better jukebox, but if you plan to use
your hard drive for other tasks while
operating the Pinnacle device, dedicate a
separate hard drive to the jukebox disk
cache for best performance.

On the other hand, if you need a single volume that's bigger than 2 gigabytes, the PLI Jukebox Junior will do the job safely. Its built-in hard drive and sensible caching scheme are real pluses, but we look forward to future improvements in the PLI software.

— John Rizzo



The Pinnacle Micro REO-6500 jukebox takes much longer than PLI's Jukebox Junior to load discs into the jukebox, mainly because it uses more disc swaps. It's also slightly slower with a single disc. However, the PLI jukebox slows down considerably when using a spanned volume consisting of several discs. The performance tests were conducted with DiskBasher benchmarks on an 8-megabyte IIci with the control-panel cache set to 256K.

Get Info

Pinnacle Micro REO-6500

tttt

Manufactured by: Pinnacle Micro, 15265 Alton Parkway, Irvine, CA 92718; (800) 553-7070 or (714) 727-3300.

Version: 2.0.

List Price: \$9,995; software, cables, power cord, \$995; optical disc, \$249.

PLI Jukebox Junior

\$\$\$¹/2

Manufactured by: PLI, 47421 Bayside Parkway, Fremont, CA 94538; (800) 288-8754 or (415) 657-2211.

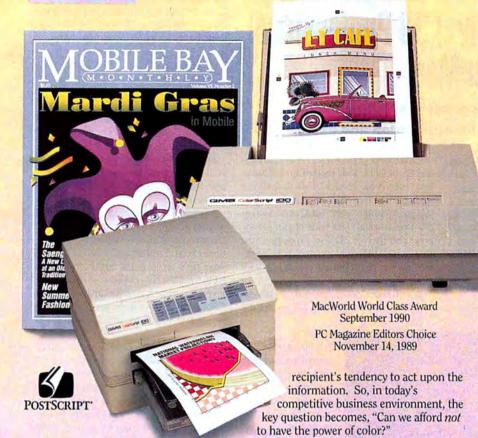
Version: 1.0.

List Price: \$9,999 (with software, cables, and power cord); hard drive and caching software, \$1,999; ten discs, \$1,999.



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GRAPHICS

SwivelArt, Swivel 3D Professional, and MacRenderMan

Three new packages specialize in 3-D modeling, rendering, and clip art for illustration and design.

Three new software packages play decidedly different roles when it comes to creating and editing 3-D images. Paracomp's SwivelArt is an inexpensive collection of 3-D clip art for casual users, Swivel 3D Professional is the latest and most advanced version of Paracomp's modeling package, and Pixar's Mac-RenderMan is a powerful rendering package that delivers photo-realistic quality to 3-D objects and scenes.

The process of creating 3-D designs

involves two steps. First you create geometric objects with modeling software, and then you render realistic-looking surfaces for the objects, based on their original geometry. SwivelArt and Swivel 3D Professional deal with object geometry, and Swivel 3D Pro supports some rendering, although its rendering capabilities are rudimentary compared with MacRenderMan's.

MacRenderMan is geared for photorealistic-quality rendering. In general, the



Swivel 3D Professional is primarily a modeling package. It also does rendering. although it can't match the photorealism of MacRenderMan. Rendering time for this 640-x-480-pixel image was 12 minutes on a Mac II equipped with a 33megahertz Marathon 030 accelerator.



This image was rendered in MacRenderMan with the default settings for the metal, stone. and wood shaders. All of the program's eight light sources were used. Rendering time for this 640-x-480-pixel image was 47 minutes on the same Mac II used for the Swivel 3D Pro images.

package's rendering engine requires that the basic 3-D geometry for objects, surfaces, and lighting positions be predefined by a compatible 3-D-modeling application, such as Swivel 3D Professional.

SwivelArt

SwivelArt is an ideal package to begin with if you're exploring 3-D modeling for the first time. It's a \$125 clip-art collection, combined with a read-only version of Swivel 3D. You can't create any new objects, but the package provides nearly 100 excellent 3-D models (text fonts as well as images) that can be scaled, duplicated, rotated, and moved about in a 3-D world.

SwivelArt's selection of premodeled objects is a good fit with business presentations. It includes computers, international icons, and maps. You can export your final art in paint, PICT, PICT2, or EPS formats. SwivelArt also includes a HyperCard stack that produces a Swivel Command File, which you can use to create 3-D text in one of 12 supplied 3-D fonts.

Because the file format and interface are the same as those of its more powerful siblings, Swivel 3D and Swivel 3D Professional, SwivelArt is a good steppingstone to 3-D-modeling packages.

SwivelArt doesn't cost much, but be forewarned that it takes a substantial bite out of your hard disk. The program and art files occupy about 4.5 megabytes of disk space.

In addition, we encountered some errors in converting SwivelArt files to PICT and EPS format that resulted in the appearance of stray lines. Some surface textures also didn't carry over when files were converted to EPS.

Swivel 3D Professional

Swivel 3D Professional is an enhanced version of Paracomp's original 3-D modeling package, Swivel 3D (see review, March '89, page 45). The chief additions to Swivel 3D include support for 24-bit color and expanded export facilities, including a format that MacRenderMan can read.

Swivel 3D Pro also includes eight new adjustable light sources that support color, shadows, and specular reflectance. The package's smooth shader is even faster than the original version's and makes for quick rendering jobs. The new package features enhanced animation capabilities as well, which make it a good choice for



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MacUser, Editor's Choice Award (Eddy), Jan. 9, 1991



PC/Computing, Most Valuable Product, Nov. 1990



BYTE, Editor's Product Merit Award, Jan. 1991



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- PS Executive Series[™] Utilities Software (to easily set printer parameters)

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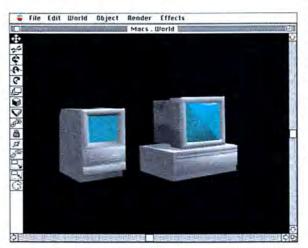
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REVIEWS



SwivelArt is a collection of 3-D clip art that comes with a read-only version of Paracomp's Swivel 3D. This file was captured in 24-bit color with the program's Shadows and Antialiasing options activated.

exporting PICS files to multimedia or video applications.

Despite these valuable additions, however, Swivel 3D Pro has several drawbacks that may prove disappointing to professional designers, particularly those who want to render models in Pixar's MacRenderMan.

Swivel 3D Pro lacks Bezier splines for creating complex curved surfaces easily. Like the original version of Swivel 3D, Swivel 3D Pro uses a polygon-based system for creating surfaces. In order to achieve a smooth surface, you must use multiple polygons to avoid the faceted look typical of most computer illustrations. Not only is this method cumbersome but when you do manage to create a smooth surface, the resulting file size is huge.

Furthermore, although Swivel 3D Pro can export files in RIB format, a standard file format developed by Pixar for describing 3-D images and used by Mac-RenderMan, Paracomp's implementation of the format is incomplete. For example, Swivel 3D Pro's RIB format supports only a few of the myriad surface shaders available in MacRenderMan. Granted, you can work around this by using ResEdit or a word processor to edit the RIB file directly, but it would be nice to have this support built in.

In addition, Swivel 3D Pro's light sources translate only as distant light, so you have no control over the scene's ambient light. As a result, once you've rendered images in MacRenderMan, they look like nighttime scenes. And although shadows are supported in Swivel 3D Pro's own basic renderer, they disappear when the file is exported to MacRenderMan.

MacRenderMan

For high-quality, photo-realistic rendering of 3-D models, MacRenderMan's power is unsurpassed. Although you can create primitive objects with MacRender-Man, the program really depends on a full-blown modeling application, such as Swivel 3D Pro, to create object geometry prior to rendering.

The heart of MacRenderMan is a series of math routines called shaders. Shaders come in eight flavors and determine image properties such as surface, light, atmosphere, and projection. The use of various shaders creates a complete scene-description environment. Each shader has a set of parameters that lets you fine-tune the appearance of each image element.

However, MacRenderMan is a programming environment; as such, it lacks a graphical interface. And its power doesn't come without a price. Tweaking all the lighting, surfacing, and rendering variables can be an extremely time-consuming process, and complex models take quite a while to render. Moreover, big files eat up internal RAM. Fortunately, the program provides controls for either maximizing program performance or cutting down on memory requirements. The control settings are numerous and difficult to decipher, but once you've learned how to use them, they're almost indispensable.

For acceptable display of finished images, MacRenderMan requires a 24-bit system. You'll also need at least 5 megabytes of RAM and a Mac II-class machine. But MacRenderMan is well worth the investment. Few other programs currently available come close to offering the photo-realistic power of MacRenderMan.

The Bottom Line

For casual users who are looking for an entry-level 3-D product or just an easy way to incorporate 3-D images into a business presentation, SwivelArt's excellent 3-D clip-art collection is a true bargain.

Swivel 3D Professional is a powerful 3-D modeler noteworthy for its speed and ease of use. Despite its moniker, however, there are several caveats for professional-level users. Some important tools, such as a Bezier tool for curved surfaces, are missing. And users who want to render Swivel 3D Pro models in MacRenderMan will find Swivel 3D Pro's link to Pixar's package not as well forged as other elements of the program.

For photo-realistic rendering of objects and scenes, MacRenderMan's power is hard to beat. Although it requires some degree of programming skill, Pixar's package lets you render entire scenes in three dimensions by letting you tweak a variety of lighting and surfacing variables. If professional results are what you're looking for, MacRenderMan won't disappoint you.

- Doug Barnard

Get Info

SwivelArt

\$\$\$\$1/2

Published by: Paracomp, 1725 Montgomery Street, San Francisco, CA 94111; (415) 956-4091.

Version: 1.2.4. List Price: \$125.

Swivel 3D Professional

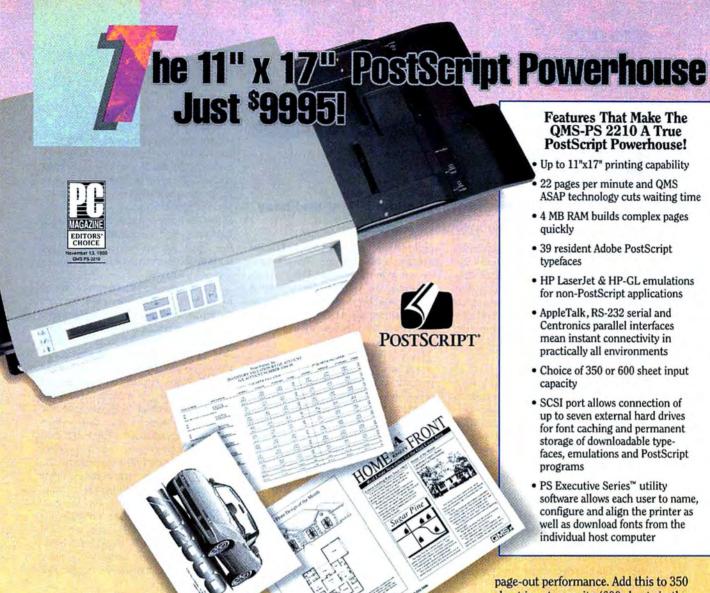
Published by: Paracomp, 1725 Montgomery Street, San Francisco, CA 94111; (415) 956-4091.

Version: 1.5.8. List Price: \$695.

MacRenderMan

Published by: Pixar, 1001 W. Cutting, Richmond, CA 94804; (415) 236-4000.

Version: 1.1. List Price: \$695.



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COMMUNICATIONS

TelePort/Fax 9600

Global Village's send-only fax modem is fast and easy to use but lacks many standard features.

Global Village Communication has added 9,600-bps Group 3 fax-transmission capability to its award-winning 2,400-bps TelePort A300 data modem. The result, the TelePort/Fax 9600, is easy to use, but it doesn't receive faxes and lacks other features that competing fax modems provide.

Minimalist Feature Set

The TelePort/Fax's minimalist feature set is designed for novices who want to send individual faxes quickly and easily. The package also includes several slick innovations, including Chooser bypass, thumbnail previews, smart dialing, and support for MNP (Microcom Networking Protocol) error correction and data compression.

Overall, however, the TelePort/Fax's simplicity comes at the expense of flexibility. More-advanced users are sure to be disappointed at the lack of many indispensable features such as gray-scale mode, user-definable cover sheets, page preview, scaling, detailed logs, scheduling, group distribution, enveloping, automatic redial, and multiple fax directories with import/export.

Most external modems attach to one of the Mac's two serial ports. The TelePort/ Fax modem, however, is an ADB (Apple Desktop Bus) device. As such, it requires a Mac SE or later. It can be placed anywhere along the ADB chain between the Mac, keyboard, and mouse, so the TelePort/Fax leaves both serial ports free for other devices.

The TelePort/Fax software emulates a serial connection, and its function key eliminates the need for an A/B box for switching between devices. With its pass-through connector, the TelePort/Fax doesn't hog the ADB port into which it is plugged. And because the modem draws its power from the ADB line, there's no requirement for a bulky external power supply.

The TelePort/Fax software comprises a control panel, a printer driver, and an application. The control panel lets you specify which serial port to emulate, provides a way to examine the modem/ handset status, and enables options such as MNP protocols, speaker sounds, and menu status. It also provides support for Apple's Communications Toolbox, a standard communications interface that will be used by many telecommunications programs under System 6.x and System 7.0. The TelePort/Fax application sends fax files that have been previously saved to disk and merges fax files created by disparate applications.

To send a fax with the TelePort/Fax, you first select the TelePort printer driver as the output device. Most fax modems force you to execute this task by using the Chooser DA, a bothersome procedure if you often alternate between the fax modem and your normal printer. With the TelePort/Fax, however, you can bypass the Chooser altogether. Just hold down the Option key when you click on the File menu to temporarily select the fax modem. And that's not the only thoughtful feature that makes the TelePort/Fax easy to use. Whenever the TelePort/Fax is selected, the Print command in most applications' File menu is renamed Fax.

 Using the TelePort/
Fax modem is easy, but simplicity comes at the expense of flexibility. The package doesn't include fax-receive capabilities, nor does it provide page preview or scaling.

Thumbnail Pages

Sending a fax is as easy as choosing Fax from the File menu, entering the recipient's name and fax number in the Teleport/Fax window, dragging the recipient's icon to the Destinations area, and clicking on the Send button. You must wait a short while as the TelePort converts your document to fax format. As it does so, it displays a small thumbnail image of each page, mimicking the output of a traditional fax machine — a very nice touch.

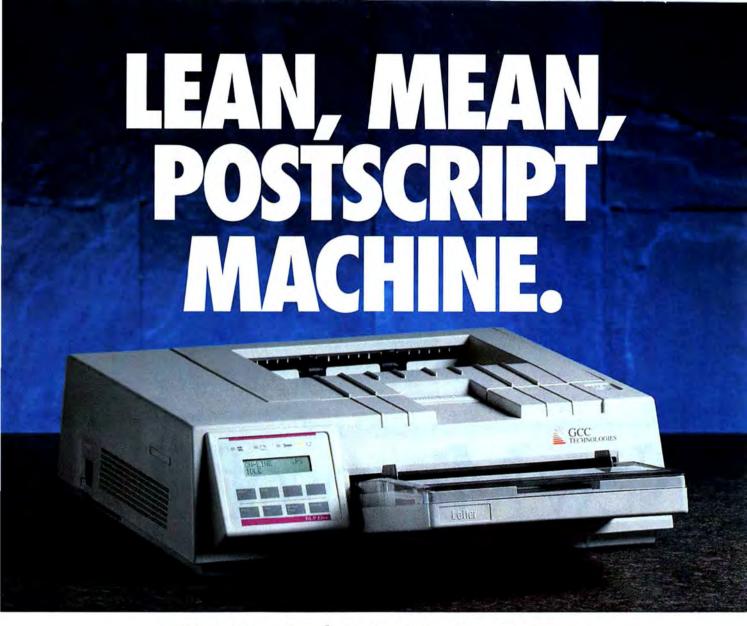
After the document has been converted to Group 3 fax format, the modem initiates the actual transmission in the background, so you can continue with your work. You can hear simulated dial tones emanating from the Mac's internal speaker, although there is no way to monitor the result of the call (dial tone, ringing, busy signal, and recorded message) without cavesdropping on a handset plugged in to the modem. Fortunately, once the modems start exchanging data, the TelePort breaks the handset connection, thereby preventing data corruption from extraneous noises.

Small icons at the right of the menu bar indicate basic fax-transmission information on such functions as dialing, connecting, and sending. Unfortunately, the TelePort/Fax software doesn't go beyond the basics to display other useful information such as the telephone number dialed, the rate of transmission, or detailed error messages.

During data communication, you can request a technical-status display that imitates the standard indicator lights on conventional modems. We wish such an option were available for fax transmissions.

To see how the performance of the TelePort/Fax stacks up against that of the competition, we put it through the same series of rigorous benchmark tests we used in our recent MacUser Labs report on send/receive fax modems (see "Fast, Full-Featured Fax Modems," May '91, page 104). The TelePort/Fax tied the topranked Abaton InterFax 24/96 and the Dove DoveFax in speed of fax creation and in duration of call, respectively.

Our one-page Word test letter transmitted without a blemish. For best text results, Global Village recommends outline fonts with ATM or TrueType, which we used. The composite PageMaker document transmitted equally impressively. The TelePort/Fax converted grayscale TIFF portions of the image into high-contrast halftone dithers, but everything else looked fine, with no geometrical



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New Microsoft Excel of an exhaustive cor



Betsy Mill put it all in perspective when she wrote to us, "I love [Microsoft] Excel as much as my microwave oven but no love is perfect."

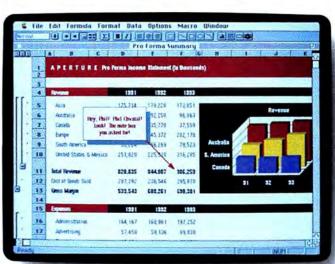
Well, Betsy, get a

load of this. We think new Microsoft* Excel version 3.0 is the closest thing to perfection ever seen in a spreadsheet for the Mac.* For one good reason.

Power made easy.

The new Toolbar, for instance, reduces common, time-consuming tasks down to one step.

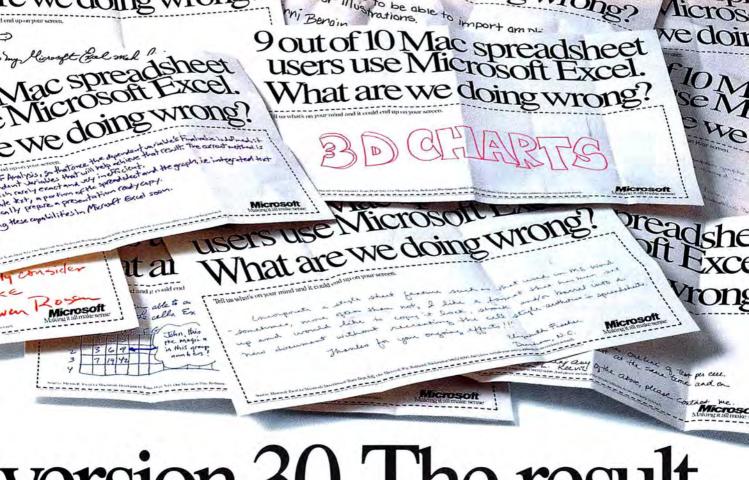
Highlight a row or column of numbers, hit the Σ button (that's Autosum'),



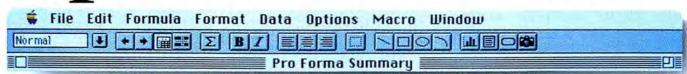
Yes, Paul, a single button now lets you access 68 chart types, 24 of which are 3-D. You can incorporate these right into your worksheet, along with text and data. And notice the outlining feature on the left? Go nuts.

and voilà - it all adds up.

Do quick, push-button formatting. Use outlining features to collapse



version 3.0. The result respondence course.



Take a look at the new Toolbar. In one step, you can now access style sheets, outlining features, Autosum, formatting options, drawing tools, charts of all kinds and macros. Go to town or expand worksheets without having to variable you need?

create multiple files. As for charting, we took our cue from Paul Woods, who began his letter with the salutation, "Charts, charts, charts!" Hey, Paul - check out the picture and caption for the full scoop.

Did we mention that you can consolidate up to 255 worksheets at a time, regardless of format?

Or the Goal Seek feature, which lets you put in the total you want and works backwards from there to fill in the Or the fact that this is the first Sys-

tem 7.0 application available?

Plus, you can update to version 3.0 for \$129. If you acquired your current version of Microsoft Excel on or after 12/7/90, the upgrade is only \$50. Call (800) 541-1261, Department Q82, to find out more.

By the way, Bryan Larson: we said hi to Bill for you. He sends his regards.

Making it all make sense



Although Global Village's speedy TelePort/ Fax 9600 modem attaches to the Apple Desktop Bus, it emulates a standard serial connection, so most applications should be able to use it without difficulty.

distortions at all. Although we appreciate the exact size reproduction, the ability to scale documents is sorely lacking.

For transmitting data, the modem is especially robust. It's Hayes-compatible, with MNP Class 4 error-correction and Class 5 data-compression technology for

error-free data communication, up to an effective rate of 4,800 bps. Of course, you must be connected to another MNP-capable modem for these features to come into play. We had no trouble accessing America Online, AppleLink, and CompuServe, using the standard configurations of several telecommunications programs. For new users, the TelePort/Fax modem comes with FreeTerm, a basic application for accessing on-line services.

The Bottom Line

Current owners of TelePort data modems can and should upgrade to Global Village's send-only fax software. The upgrade is a steal at only \$60. However, if you're new to the fax-modem market, the top-ranked DoveFax from Dove Computer may be a better choice than the current incarnation of the TelePort/Fax 9600. Even though the DoveFax costs about \$100 more, it offers ease of use and a host of useful features that make it worth the extra money, particularly if you want to receive faxes through your modem.

A major upgrade that addresses many of the TelePort/Fax's shortcomings should be available at about the time this review appears. The new package is slated to include page preview, scaling, detailed logs, and perhaps even group distribution. Such enhancements should make it more attractive to users who demand functionality as well as ease of use.

- Owen W. Linzmayer

Get Info

TelePort/Fax 9600

ttt1/2

Manufactured by: Global Village Communication, 1204 O'Brien Drive, Menlo Park, CA 94025; (800) 736-4821 or (415) 329-0700.

Version: 1.05.

List Price: \$295; fax upgrade for TelePort A300 data modem, \$60.

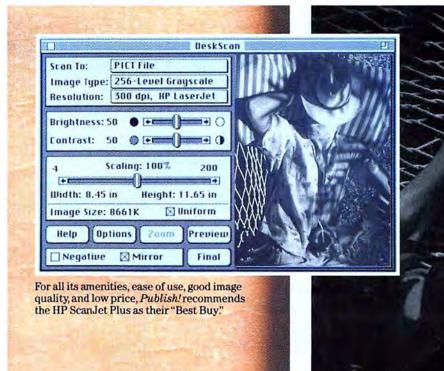
With the HP ScanJet Plus, you've

The HP ScanJet Plus scanner provides 8-bit photographic-quality scanning.

That means 256 shades of gray. For the richest, most-detailed images your Mac can muster. With the ScanJet Plus, the great results come easy. At the click of your mouse, you can get negative or mirror images, as well as scaling in 1% increments. From 4-200%. And to make things even easier, this desktop scanner has an automatic exposure feature.

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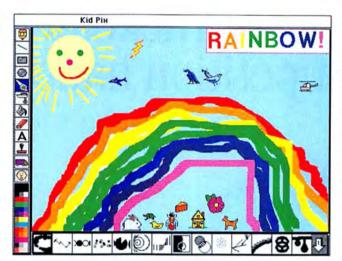
GRAPHICS & DESIGN

Kid Pix

Wacky brushes and scratchy-sounding pencils make Brøderbund's new painting program one of a kind.

Kid Pix is a new color painting program created just for kids. But you don't have to be a kid to enjoy it. As the wildest, craziest mix of unique painting tools and zany sound effects you can find anywhere for the Mac, Kid Pix stole the show during Apple CEO John Sculley's keynote address at last January's Macworld Expo.

Kid Pix is so easy to use that even a young child can master it. The entire work space is visible at all times. There are no scroll bars, and all the program's tools are



Kid Pix is a new painting program that even the youngest child can master, although once their parents have discovered it, kids may have a hard time getting a turn.

accessible from the main screen. You won't find any cluttered tool palettes or overlapping document windows.

The drawing and painting tools are easy to use, as is the Color palette. Each tool has a unique sound associated with it that you hear when you use the tool. The Kid Pix

paint bucket, for example, makes a splashing noise. The basic freehand-drawing tool is the wacky pencil, which makes a scratchy sound as you draw it across the screen. You can select different line thicknesses and patterns from the palette at the bottom of the screen.

got it made in the shades.



CoStar's new ergonomically designed trackball beats the competition hands down.



Old fashioned trackball

Stingray ergonomic trackball

A few years ago trackballs were a big idea. They provided more speed and precision than a mouse and took up less desk space. Unfortunately, over time they also felt big. And heavy. And uncomfortable.

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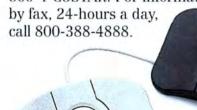
Unlike its predecessors, Stingray's no-miss buttons make up 70% of its surface area.

The Stingray was carefully designed to work with the human hand. It's low profile offers a natural position, reducing strain on the hand.

wrist, and forearm. The ball is 75% smaller and lighter. And the jumbo size buttons mean that no matter where your hand rests on the Stingray, it's resting on a button.

So, if you'd like all the advantages of a trackball with all the comfort of a mouse, give us a call. When you compare the Stingray to the pointing device you're now using we think you'll agree, there's just no competition.

Stingray retails for \$129. Existing trackball owners can upgrade to Stingray direct from CoStar for \$49 (expires 9/30/91). For more information or the dealer nearest you, call 800-4-COSTAR. For information



Stingray: available in Mac Platinum and



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NEW ON THE MENU REVIEWS

Several tools are unique to Kid Pix. When you select the wacky brush, the stamp, the electric mixer, or the eraser, the palette at the bottom of the screen changes to show variations of the selected tool.

Leaky Pens, Bubbly Paint

The wacky brush applies paint to the drawing. All the wacky-brush variations in the palette perform this task differently. One acts like a leaky pen, leaving ink that collects and soaks into the drawing surface. Another leaves bubbles in its wake. Yet another creates a variety of barebranched tree shapes (you must supply the leaves) that spring up wherever you use it. You can avail yourself of more variations by holding down the Option key while you select the brush type you want.

The stamp lets you apply small pictures to the painting, accompanied by the sound of a rubber stamp hitting paper. More than 100 pictures come with Kid Pix, and you can easily create your own with the builtin stamp editor.

The electric-mixer tool operates like

the wacky brush, in that it has many different variations. The mixer affects the entire painting, emptying all filled areas or creating snowflakes over an image, for example.

Because sound is an integral part of Kid Pix, even the text tool comes with audio effects. Each time you choose a letter, you hear it spoken in one of many children's voices. You can hear Spanish-speaking voices in addition to English-speaking ones.

Kid Pix lets you record sound with each document, using either Farallon's MacRecorder, which requires System 6.0.7 or later, or the built-in microphone of the newer Macs. If a Kid Pix document contains a sound, you'll hear it when the document is opened.

For those who are concerned about turning their Macintosh over to small children, Brøderbund has wisely provided a Small Kids mode, which makes the full menu bar disappear. That way, children can't inadvertently launch DAs or switch applications.

The Bottom Line

Kid Pix is a wonderful program. Children can grasp the straightforward interface quickly, the sounds are a riot, and the program sneaks in a good complement of learning with the fun. There's plenty of entertainment for adults too. Kid Pix comes with enough tools, patterns, colors, and innovative sound effects to keep kids—as well as the most jaded of Macintosh users—occupied for hours.

- Stephan Somogyi

Get Info

Kid Pix

Published by: Brøderbund Software, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3200.

Version: 1.0. List Price: \$49.95.



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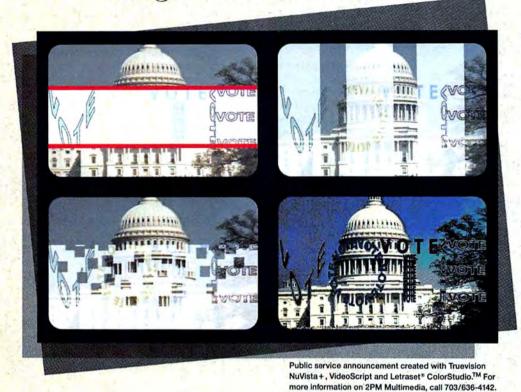
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UTILITIES

SAM and Virex

Two programs deliver strong medicine for preventing and curing computer viruses.

You'll know when your Mac contracts a computer virus. If you don't nip the infection in the bud, you can easily face a cranky computer that generates printing problems, suffers from system crashes and data loss, and may even damage your media.

Diagnosis and Cure

Fortunately, professional diagnosis and cure are available in the form of two virus-prevention programs: Microcom's Virex and SAM (Symantec Anti-Virus for Macintosh). Both are now available in their

third iterations, sporting improved interfaces and up-to-date detection and eradication capabilities. You're well advised to add one of these virus-prevention utilities to your standard Macintosh survival tool kit.

At first glance, the only difference between the two applications appears to be cosmetic — for instance, Virex displays icons at the top of the screen and mounted disks at the bottom, and SAM does the opposite. The programs differ also in some of the options and methods they employ to perform their tasks.

Both Virex and SAM use an INIT to detect viruses and application software to destroy them and repair damaged files. The Virex and SAM INITs offer several options for automatically scanning for and detecting viruses: on startup, on shutdown, and when floppy disks are inserted or removable cartridges are mounted. You can also use a key code to cancel scans in both programs, or you can lock the scans in place so they can't be changed. Network and MIS managers can use passwords to

prevent users from modifying any of these options.

Virex uses a pop-up menu that lets you set these INIT options in a control panel, but SAM provides a set of buttons in a control panel that are cleaner and easier to use.

In addition to doing scans, both programs' INITs constantly monitor your system for events indicating possible infections. SAM breaks these events into 14 categories that range from innocent operations, such as copying an application to disk, to more-foreboding actions, such as an attempt to add code resources to a file. At its most advanced level of use, SAM lets you turn these 14 categories on and off as needed. This is useful to programmers who want to add code to an application while still maintaining some protection.

Virus Alert

If either Virex's or SAM's INIT detects something suspicious in an operation, it will alert you with a dialog box that asks

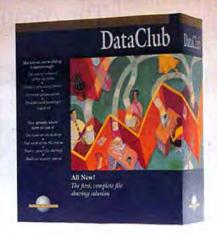
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DataClub® lets every Mac on your network contribute to network file sharing. And it's so easy, you already know how to use it! At the heart of DataClub is the concept of a Virtual Server™. A Virtual Server is a file server that doesn't reside on any single Macintosh, but rather uses free space on hard disks already on the network. DataClub then treats this free space—no matter how many machines it's on—as a single file server that appears as one desktop volume to anyone needing to share files.

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DataClub allows client access from
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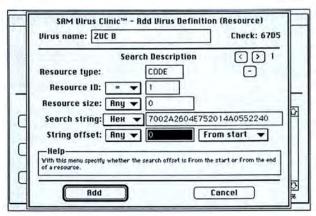
Even if a Mac is turned off or disconnected from the network, the Virtual Server continues to operate. Administration features include familiar password protection and centralized back-up. Even IBM-compatibles can access files on the Virtual Server using Farallon's PhoneNET Card PC and PhoneNET Talk (formerly AppleShare PC).

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NEW ON THE MENU REVIEWS



Symantec's hot line and bulletin board issue updates for detecting new viruses, and you add them via SAM's Add Virus Definition (Resource) dialog box.

you to allow or deny the action. SAM adds a useful third option that builds an exceptions file, so you don't have to go through the dialog box for actions you initiate regularly.

Both programs create a helpful audit trail of detected viruses, effectively creating a hard-disk history of infections.

Once a virus has been found, both programs provide resources for eradicating it

and for repairing any damaged files. Virex lets you automatically repair files from within the INIT's Scan dialog box, a handy approach that lets you fix the problem immediately. SAM users must use the SAM application. Both Symantec and Microcom advise that any infected file is dangerous, however, and should be replaced with a clean backup copy rather than be repaired.

For further protection against undocumented virus strains, Virex also includes a Record/Scan option that builds a historical reference point for files, including details such as modification dates, file sizes, and a record of added code resources. If a new and unknown virus infects the file, Record/Scan will improve Virex's chances of detecting it.

SAM includes options for scanning in a dozen or more different ways, such as by file, folder, or volume. And a feature called Inoculation adds code to an application or INIT. The code acts as a kind of barrier to the files. Any undocumented viruses that manage to get by SAM's periodic scans first change the barrier code, alerting users to a virus attack.

SAM's INIT weighs in at a hefty 180K of memory, and the slimmer Virex is half that size. Fortunately for those who are concerned about conserving memory, SAM includes a scaled-down INIT called SAM Intercept Junior. This "lite" version of SAM scans inserted floppies and monitors the desktop.

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a natural deskside companion for any Mac. In fact, MACWORLD says, "The likable little microLaser is the best all-around value."† Company office. Great company. For more power where power counts, there's the \$2,644* microLaser PS35 with 35 scalable fonts. MacUser calls it "The clear winner in the personal printer category....It gives you

more bang for the buck and outperforms all its competitors in most performance tests."‡ Shared office. Shared printer. Now here's the right match for one Mac or many. In fact, the 16 ppm microLaser XL is a natural fit for an AppleTalk® network. And like its slightly smaller cousin, this workhorse printer offers you either 17 or 35 scalable fonts, priced at

A virus checker is only as good as its ability to detect new virus strains. Each program builds intelligence for tracking new symptoms, but the best protection comes in the form of the updates both publishers provide.

In fact, the hassle of providing constant updates for the latest strains has driven some companies out of the virus-detection business. But Microcom and Symantec continue to supply upgrades by mail to users whenever a new strain is discovered. You enter the supplied information into the programs' virus-definitions files, and the packages are programmed to detect the new virus.

In addition to notifying users by mail, Symantec provides a toll-free number and a bulletin board for update information. MIS managers will appreciate a new feature in SAM that allows networked users to access a single virus-definitions file on the network server. That means there's only one file to update when new viruses appear.

SAM 3.0 is System 7.0-ready, with

balloon help, the ability to scan DAs at launch, and support for Apple events (so you can scan for viruses by dragging files over the SAM icon).

Virex 3.2 supplies an installer that places the INIT and the application in your System Folder automatically, an easy solution that will be a boon to novice users. It is also currently the only program that combats an unconventional Hyper-Card virus that originated in Europe. Virex's System 7.0 support, however, is now limited to balloon help.

The Bottom Line

There's no question that viruses are running rampant throughout universities, high schools, and big corporations. Copy shops too are a breeding ground for viruses in the DTP world. Unless you keep your Mac in a hermetically sealed environment, virus protection is a must.

When it comes to choosing between Virex and SAM, we give SAM the edge in features and usability, although both of these programs provide solid virus protection and damage control.

- Ben Templin

If you want to learn more about viruses, check out the Virus Encyclopedia Stack. It's available on Zmac. — Ed. 📳

Get Info

SAM

Published by: Symantec, 10201 Torre Avenue, Cupertino, CA 95014; (408) 253-9600.

Version: 3.0. List Price: \$99.

Virex

\$\$\$\$1/2

Published by: Microcom, Inc., P.O. Box 51489, Durham, NC 27717; (919) 490-1277.

Version: 3.2. List Price: \$99.95.

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SYSTEM 7.0

To the best of our knowledge, the products and their corresponding versions preceded by the symbol @ are compatible with System 7.0. This information is based on data gathered prior to press time from individual manufacturers and other validated sources. For additional information concerning product compatibility with specific features of System 7.0, please ask your salesperson at the time of your order.

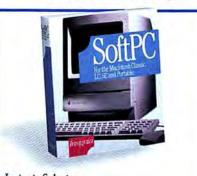
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ACCOUNTING, DATABASES, SPREADSHEETS, WORD PROCESSING

*	Aatrix Software 30 day MBG
5872	OCheckwriter II 3.2 \$32.
3976	@Payroll 4.1.1
8053	OUltimate Payroll 4.1 199.
	Abacus Concepts
8937	MacSpin 3.01 169.
4482	
4481	StatView II 1.03
	SuperANOVA 1.1 (Plus, SE or II) ea. 309.
5907	Statview II/SuperANOVA Bundle 569.
*	Acius 30 day MBG
	@ 4D Write 1.0.1 or @ 4D Calc 1.0 229.
5618	6 4th Dimension 2.2
7838	Q 4D Compiler 1.0 889.
6948	
	Advanced Software 30 day MBG
5608	DocuComp 1.5
	A Lasting Impression
	ResumExpert or Cover Letters . ea. 48.
	Sales & Marketing, Management Edition
	Computer Science & Engineering ea. 48.



Insignia Solutions 9726 SoftPC 2.0-Allows Mac to run MS-DOS applications. Compatible with Mac II family, SE, SE/30, Classic, LC, Portable and the Plus. Offers complete IBM PC compatibility combined with Mac's ease of use \$135. with your purchase of any of these products, call us for an authorization and return it with all of the original packaging within the guarantee period for a refund check (or credit on your credit card). We reserve the right to limit quantities on such returns.

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We only carry the very latest versions of products. For products or versions not yet released at press time we've indicated the expected availability dates as supplied to us by the manufacturers. We'll give you all the latest information when you call.

Also, all software is not copy-protected, unless indicated otherwise by (CP).



Ashton-Tate

1324 Full Write Professional 1.0-Full-featured word processor at an incredible price. Buy now & for a small shipping & handling fee, get version 1.1 directly from Ashton-Tate, or upgrade to version 1.5 for an additional \$49. special \$39.

*	ASD Software 30 day MBG
7619	Planisoft 1.21 (1 user) 195
7620	(5 user) 579. 7621 (10 user) 839
	Ashton-Tate
1324	FullWrite Professional 1.0 special 39
	Avery 60 day MBG
7446	MacLabel Pro 1.03 48
*	Baseline Publishing 30 day MBG
	⊘ Vantage
8882	1 Shot Worksheet
8881	7 Thunder 7 56
	Chang Labs 30 day MBG
1611	OC.A.T. 3.0 special 249
1	Checkfree Corp 30 day MBG
	Checkfree Mac 1.5 19
*	CheckMark Software 60 day MBC
5861	CashLedger 1.3A
	Payroll 4.5
5863	MultiLedger 2.0 235
	Claris
1129	
	FileMaker Pro 1.0V2 215
	MacProject II 2.1V3
	Deneba Software 30 day MBG
4700	BigThesaurus 1.0 64
	Coach Professional 3.1 124
	DeltaPoint 60 day MBG
1546	Taste 1.01 with UltraPaint 1.03 79



MacConnection ... 2 year warranty SIMMs-Have we got SIMMs for you! System 7 is memory intensive and requires a minimum of 2 megs. All SIMMs include complete instruction booklet and video (VHS or 8mm). See line listing for specifics.

	ElseWare Corp.
1506	DataShaper 1.2 135.
.000	Fox Software
5572	●FoxBASE+/Mac 2.01 289.
3372	Franklin Software 30 day MBG
7070	Language Master 2.0 45.
1010	Informix
1055	
4955	Wingz 1.1A
2405	Intuit 30 day MBG
2425	Q Quicken 1.5
*	Kaetron Software 30 day MBG
8941	TopDown 3.0
*	Mainstay 30 day MBG
7718	MacFlow 3.5.4 169.
*	MECA 60 day MBG
2796	Managing Your Money 4.0 99.
*	Microlytics 60 day MBG
	Strunk & White's Elements of Style 1.0 34.
	Inside Information 1.0 68.
	Random House Encyclopedia 1.0 . 68.
	Microsoft 30 day MBG
	Works 2.00D
	W ord 4.0D 245.
9803	@Evcel 3.0 309
5454	© Excel 3.0
1420	Excel 3.0 Companion Book 20.
1420	Niles & Associates 30 day MBG
E040	©EndLink 1.1.3
4602	O End Note 1 2
	©EndNote 1.3
8010	
*****	Nolo Press 30 day MBG
	© For the Record 2.0 30.
2981	WillMaker 4.0 (not valid in LA.) 35.
المسال	OCR Systems
9926	ReadRight 1.0 309.
*	Odesta 30 day MBG
5621	O Double Helix III 3.5 439.
6468	DataDesk 3.0 459.
	Paragon Concepts
5683	ONisus 3.06
*	Portfolio Systems 30 day MBG
7992	ODynoPage 1.0
6916	ODynodex 2.0
*	PowerUp 30 day MBG
7696	Calendar Creator 1.01 34.
7697	O Letter Writer Plus 1.01 52
7694	• Address Book Plus 2.0 (June '91) 57. • Fast Forms 2.0

Apple's System 7

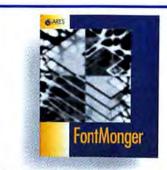
	the second second	
* Prov	ue 60 day MBG	
4582 Pano	orama 1.5	\$245.
★Que	Corp./RightSoft 3	0 day MBG
7482 Right	tWriter for the Mac 3.1.	54.
*Real	ity Technologies 3	0 day MBG
6929 OW	ealthBuilder 1.01	95.
	rence Software 30	
6268 @Gr	rammatik Mac 2.0	call
Roui	nd Lake Publishing	
O Le	etterWorks, Sales or Lega	al . ea. 52.
*Shar	na 30 day MBG	
8810 Inform	med Manager 1.0.1	99.
7692 Inform	med Designer v. 1.1.1 .	159.
*Softs	sync/BLOC 30 day	MBG
7129 OAc	countant, Inc. 2.1	339.
	ware Discoveries 3	
8118 Reco	ordHolder Plus 3.1	85.
	ware Toolworks	
8366 ODo	ollars & Sense 5.0	59.
9863 Word	for Word 1.2	85.



Teleware ... 30 day MBG

7616 M. V.O.B. 2.0—Incredible, easy to use, accounting software for small to medium size businesses. Features include fully integrated A/P, A/R, General Ledger, Inventory, Checkbook and Card File. \$139.

*	Survivor Software 30 day MBG
	MacMoney 3.5 59.
	Symantec 30 day MBG
3422	More 3.0
*	Synergy 30 day MBG
	KaleidaGraph 2.1.2 145.
*	Teleware 30 day MBG
7616	M.Y.O.B. 2.0
*	TIMESLIPS 30 day MBG
2986	⊘ Timeslips III 2.0E 194.
*	rT/Maker 30 day MBG
3639	WriteNow 2.2/Grammatik Mac 119.
	SmartBundle (4 programs in one!) . 215.
	Williams & Macias 30 day MBG
	myDiskLabeler III 3.04 42.
	StickyBusiness 1.4 51.
	WordPerfect 60 day MBG
	WordPerfect Mac 2.0 279.
	(5 Pack). 1195. 9866 (20 Pack). 3599.
	Writing Tools Group 30 day MBG
6984	Correct Grammar 2.0 55.

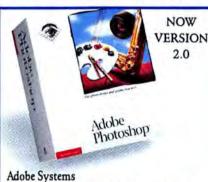


Ares Software ... 30 day MBG

8878 FontMonger 1.0—Converts type formats between PostScript Type 1 (for use in Adobe Type Manager), Type 3 & True Type (for System 7.0). Generates customized typefaces & characters such as obliques, fractions & small caps . . \$62.

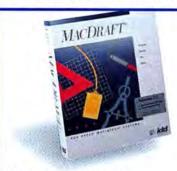
GRAPHICS & DESIGN PUBLISHING, PRESENTATIONS

*	Abbott Systems 30 day MBG
	Cheshire 1.0 62.
	Adobe Systems
	Adobe Type Library (Vol. 1-224) . call
6957	Adobe Type Reunion 1.0.1 41.
5750	Adobe Type Manager 2.0 59.
6053	Adobe Plus Pack 118.
6156	Adobe Plus Pack/ATM 174.
6098	TypeAlign for ATM 1.0.4 62.
6671	Adobe Type Set 1 or 6677 Set 2 62.
7587	• Adobe Type Set 3 125.
8042	Adobe Type Sets 1-2-3 Bundle . 239.
8171	Adobe Illustrator 3.0.2 (w/ATM) . 379.
6644	Adobe Photoshop 2.0 (July '91). 549.



6644 Adobe Photoshop 2.0—Photo-editing & production package featuring new Bezier selection tool, Duotone images, on-screen editing of CMYK color, professional color separations, Pantone color support, PostScript rendering & more . . . \$549.

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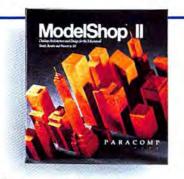


	Pacalina Dublishing 20 day MPC
8055	Baseline Publishing 30 day MBG Screenshot
8872	MasterPaint
7784	Color MacCheese
7828	
1020	Bitstream
9428	
1591	
	Broderbund Software
9351	Kid Pix 1.0 29.
1427	
6281	
*	Casady & Greene 60 day MBG
8879	Fluent Font Library 4.0 99.
	Claris
1123	MacPaint II 2.0 89.
1117	MacDraw II 1.1V2 285.
8007	OClaris CAD 2.0 629.
7	Creative Software 30 day MBG
6645	@Easy Color Paint 2.0 45.
7	Custom Applications 30 day MBG
8037	The second secon
6517	Freedom of Press 3.01 (35 fonts) 255.

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MacConnection

Can take Macs to



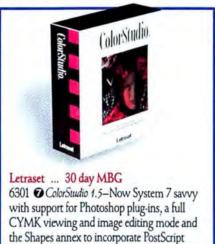
Paracomp ... 30 day MBG 5028 **②** ModelShop 2.0—Gives you the 3D spatial design, modeling, and presentation capabilities of 3 or 4 other packages, including

spatial design, modeling, and presentation
capabilities of 3 or 4 other packages, including
animation, walk-throughs, fly-bys, and high-
end rendering

★DeltaPoint ... 60 day MBG

,	r Deltaroint 60 day MbG
6095	DeltaGraph 1.5
	O DeltaGraph 1.5
	C Delleba Soltware So day Mibd
6365	O UltraPaint 1.03 125.
1769	② Canvas 2.1.1 (free upgrade to 3.0) 189.
	Dream Maker 30 day MBG
	Or an inaker So day mbd
	Cliptures: Business 1 or 2 ea. 68.
7684	Cliptures: Sports
	Electronic Arts
1215	OStudio/8 2.0 189.
4313	V Studio/6 2.0 169.
8056	•Studio/32 1.1
7	Foundation Publishing 60 day MBG
6729	Comic People or 6646 Kid Stuff ea. 20.
6720	Comis Ctris Footes 1 6
0/20	Comic Strip Factory 1.6, 36.
9438	Comic Strip/People & Kid Bundle 71.
	IDD/Innovative Data Design
2417	MacDraft 2.1
4707	O D
4/0/	ODreams 1.1 419.
,	Image Club Graphics 30 day MBG
7523	Evolution 1.02 49.
	Letraset 30 day MBG
0010	Lettaset 30 day MBG
2619	@ImageStudio 1.7 139.
2621	• Ready Set Go! 4.5A 165.
	ColorStudio 1.5
0001	Colorstadio 1.5
7	Linguist's Software 60 day MBG
	Over 100 language fonts call
4	Loop Software 30 day MBG
8726	OverView 1.0
0/20	Overview 1.0
	Mainstay 30 day MBG
9798	Capture 4.0 (July '91) 75.
4	MediaLab Tech 30 day MBG
0725	PictureAccess 1.0
3723	riciuleAccess 1.0
8218	PictureLink 1.1
7	MicroFrontier 30 day MBG
7886	©ENHANCE 2.0 (June '91) 235.
	MicroMaps 30 day MBG
7554	MapArt (Paint)
7556	MapArt (PICT) or 7555 (EPS) ea. 95.
-	Microsoft 30 day MBG PowerPoint 2.01D
2070	A Power Point 2 Of D
2010	OFOWEIFOINI 2.01D 245.
	Monotype Typography
	Monotype Imprints-TrueType ea. 22.
	Multi-Ad Services
9767	Multi-Ad Creator 2.5 455.
0/0/	
	PANTONE
7466	Process Color Imaging Guide 48.
4	Paracomp 30 day MBG
5000	OMadalChan O.O.
3028	• ModelShop 2.0 559.

7728	SwivelArt 1.0
7441	
8957	Swivel Pro/MacRenderMan Bundle 899.
	Quark
7612	QuarkXPress 3.0 519.
-	Springboard 30 day MBG
3530	Certificate Maker 2.02 22.
	Strata
7773	Stratavision 3D 1.5.5 349.
7772	Stratavision 3D SRX/Renderman . 999.
	Strategic Mapping
6518	ATLAS • MapMaker 4.5
-	SuperMac Tech 60 day MBG
3380	PixelPaint 2.1
5625	PixelPaint Pro 2.0 499.
*	Tactic Software 30 day MBG
8251	Icon It! 2.1 44.
8252	Magic Typist or 8249 Art Fonts . ea. 49.
8263	Art Clips 1 . 49. 8261 Art Clips 2 . 64.
8248	Font Share 2.2 129.
	3G Graphics
3942	Images with Impact: Graphics 1 49.
4583	Images with Impact: Business 1 64.
6379	Accents & Borders I 64.
	Timeworks 30 day MBG
7115	Publish It! Easy 2.01 139.
	7441 8957 7612 3530 7773 7772 6518 3380 5625 8251 8252 8263 8248 3942 4583 6379



	★T/Maker 30 day MBG
	Full line available, EPS or Bitmap ca
	Ventura Software
8962	Ventura Publisher 3.0 499
	★Visual Business Sys 30 day MBC
9867	GraphMaster 1.1
	★Wildflower 30 day MBG
6512	• SnapJot 3.01
	★Zedcor 60 day MBG
3986	DeskPaint & DeskDraw 3.0.3 225

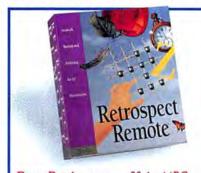
drawing capabilities \$599.

PROGRAMMING

UTILITIES, HYPERCARD

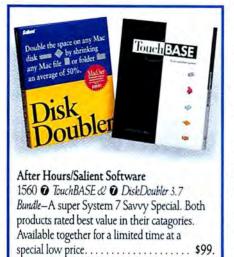
	ADDUIT Systems 30 day MDG
5236	CanOpener 1.1 62.
	Advanced Software 30 day MBG
8051	@Intouch 1.1
9986	Intouch Server (3-Pack)
*	Affinity Microsystems 60 day MBG
7835	Tempo II Plus 2.0.3 105.

	After Hours/Salient Software
1352	TouchBASE 1.02\$87.
1560	TouchBASE/DiskDoubler Bundle. 99.
*	Aladdin Systems 30 day MBG
	OShortcut 1.5 45.
	Stufflt Deluxe 2.0 62.
*	Aldus/Silicon Beach 30 day MBG
5100	SuperCard 1.5 199.
*	SuperCard 1.5 199. ALSoft 30 day MBG
9807	ODiskExpress II 2.07 53.
	MasterJuggler 1.53 53.
9886	MultiDisk 1.27 53.
	Apple Computer/Claris
1074	• System 7.0
8734	OHyperCard Development Kit 2.0 149.
4	ASD Software 30 day MBG
	MaccessCard Reader (reg. FileGuard) 299.
9439	MaccessCard/FileGuard (1) Bundle 399.
7085	FileGuard Extended 2.5.3 (1 user). 139.
7422	(5 user) 489. 7423 (10 user) 799.
	Baseline Publishing 30 day MBG
	Personality 28.
7783	OINIT Manager
4780	O DAtabase
	Berkeley Systems 30 day MBG
	• After Dark 2.0T
1541	Stepping Out II 2.02 49.
*	Casady & Greene 60 day MBG
2269	• QuickDEX 1.4D
7443	A.M.E. 1.1.3 (single) 159.
7444	A.M.E. (5 user) 509. 7831 (10 user) 849.
	CE Software 60 day MBG
4689	MockPackage Plus Utilities 4.4 31.
1727	CalendarMaker 3.0.1 31.
6278	DiskTop 4.0 63.
7518	Alarming Events 1.01 84.
8024	QuicKevs ² 2.0.1 94.
*	Central Point 30 day MBG
5040	Copy II Mac 7.2 24.
5041	Mac Tools Deluxe 1.1 79.
*	Connectix 30 day MBG
7830	Maxima 2.0
1563	Virtual 3.0 (July '91)
6647	7 HandOff II 2.2
*	PhandOff II 2.2
5255	• Retrospect 1.2
7945	Retrospect Remote 1.2 264.
7946	

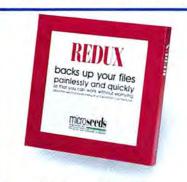


Dantz Development ... 30 day MBG
7945 Retrospect Remote 1.2—Provides automatic,
unattended workgroup backup using any
Apple Talk network. Backs up 10 Macs; add
more with Remote 10-Packs. Supports all
tape, optical, and cartridge drives \$264.

performance heaven.



,	Design Science 30 day MBG
	MathType 2.11
	Digitalk 60 day MBG
5166	SmallTalk/V Mac 1.1 123.
	Dubl-Click Software
7974	ClickChange 1.04 56.
1824	Calculator Construction Set 2.09.6 . 62.
	ElseWare Corp.
1507	Bar Code Kit
,	Fifth Generation 30 day MBG
4287	
3955	3 Suitcase II 1.29 49.
8284	SuperSpool 5.0 62.
8286	SuperLaserSpool 2.02 93.
5178	
5725	
7	Go Technology 60 day MBG
1488	Hot Keys Universal (word processor) 36.



Microseeds Pub. ... 60 day MBG

2913 • Redux 1.63—Backs up your files painlessly and quickly so that you can work without worrying about the health and wellbeing of all the stuff on your hard disk . . \$49.

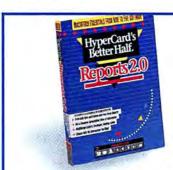
1490	Hot Keys PageMaker \$36.
7	Hyperpress 30 day MBG
4233	Icon Factory 2.0
	ICOM Simulations
	On Cue 1.3
1474	TMON Professional 142.
7	Insight Development 30 day MBG
6171	MacPrint 1.23 93.
2000	JAM Software USA 30 day MBG
	Smart Alarms w/Appt. Diary 3.1 . 63.
6088	
	Kent Marsh Ltd 30 day MBG
05407	Q QuickLock 2.0
2501	The NightWatch 1.03 84.
0510	FolderBolt/NightWatch Bundle 139.
6134	MacSafe II 2 0
0104	MacSafe II 2.0
6267	KiwiEnvelopes! 3.1.1 32.
7445	KiwiFinder Extender 1.02 63.
1415	Loop Software 30 day MBG
	PictureBook 3.2A
1	Magic Software 30 day MBG
	AutoSave II 2.0
7270	
*	Microcom 30 day MBG
8562	Complete Undelete 1.1 48.
4803	O Virex 3.2
8561	911 Utilities 89.
7	Microseeds Pub 60 day MBG
7068	②INITPicker 2.01
2913	
*	Microsoft 30 day MBG
	QuickBasic 1.0 64.
	Multi-Ad Services
	Multi-Ad Search 1.0
0707	Nine to Five Software 30 day MBG
9/6/	Reports 2.0
6025	Now Utilities 2.0.3
6730	Prototyper 3.0
0/55	Olduvai
4503	MultiClip 2.1 (June '91) 69.
4	ON Technology 1 year MBG
6385	On Location 1.02
9801	Meeting Maker (5) 289. 9800 (10) 549.
*	Palomar Software 30 day MBG
8210	PLOTTERgeist 2.0 (June '91) 199.
7	Salient Software 30 day MBG
7404	ODiskDoubler 3.7 (June '91) 49.
*	Softstream 30 day MBG
	HyperHit 3.0 119. 1568 (network) 389.
*	Solutions, Inc 60 day MBG
	SmartScrap & The Clipper 2.1 56.
3449	
0000	Spinnaker 30 day MBG
0092	Plus 2.0
	DiskFit 2.0
33//	Symantec 30 day MBG
5176	Symantec AntiVirus for Mac (SAM) 65.
	Symantec Utilities for Mac (SUM II) 96.
6740	Chlorian Litilities for the Mond 1



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A winning team! The perfect combination of hard disk and folder security. Rigorous yet elegantly simple. Full or read-only protection with a click of the mouse. And much more! 9513 • FolderBolt \$73. 2591 • Night Watch \$84.

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6665 MacPhonebook 3.0
7147 MacEnvelope 5.02 57
6666 MacEnvelope + 2.0 185
★ Systems Compatibility 30 day MBG
7872 OSoftware Bridge 1.0 79
★ Tactic Software 30 day MBG
8964
★Teletypesetting 30 day MBG
8601 TScript Basic 1.4
8058 TScript 1.4 91
★TGS Systems 60 day MBG
6667 Prograph 2.0 Compiler Version . 245
★ Wolfram Research 30 day MBG
8276 Mathematica Std. 2.0 (July '91) 539
8273 Mathematica Enhanced 2.0 (July) 799
★Zedcor 60 day MBG
3985 ZBasic 5.0



Nine to Five Software ... 30 day MBG

9767 • Reports 2.0—Completes HyperCard and turns it into the most affordable, powerful information management system on a Mac. Design & print any kind of report: mail merge, labels, statements, etc. 4½ Mice Mac User, 6/91.. \$94.

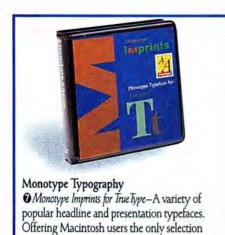
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THINK Pascal or 3420 THINK C 165.

6748 Norton Utilities for the Mac 1.1.

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CD-ROM

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	Adaha Contant
9704	Adobe Systems
	Adobe Type On Call CD/ATM 47.
9443	Adobe TOC & Porta Drive Bundle . 659.
0057	CD Technology
8057	Porta Drive CD-ROM
7686	Porta Drive & MS Office CD-ROM . 999.
0010	Chinon
	CDA-431 CD-ROM Drive 599.
	Discovery Systems 60 day MBG
9968	Birds of America (CD-ROM) 52.
9965	Sherlock Holmes on Disc (CD-ROM) 52.
9966 Shakespeare on Disc (CD-ROM) 52	
0011	Dubl-Click
9944	The WetSet CD (CD-ROM) 218.
7	Highlighted Data 30 day MBG
	Webster's Dictionary (CD-ROM). 159.
	HyperGlot 30 day MBG
9//8	Learn to Speak English, 7473 French,
	or 7829 Spanish (CD-ROM) ea. 64.
	Microsoft 30 day MBG
6382	The Microsoft Office (CD-ROM) 599.
	Multi-Ad Services
	ProArt Trilogy 1, 2 or 3 (CD-ROM) ea. 219.
	NEC
6636	Image Gallery (2800 line art) 246.
6959	Type Gallery PS (Adobe fonts) 246.
9441	CDR36 CD-ROM Portable Drive 399.
7	Somak 30 day MBG
	LaserArt I or II (CD-ROM) ea. 62.
2202	Toshiba
6749	XM 3201 CD-ROM Drive 699.
	VIDEO & COUND
	VIDEO & SOUND

VIDEO & SOUND MUSIC, MIDI, ANIMATION

7	Ars Nova 30 day MBG
1215	Practica Musica 2.2 66.
	Articulate Systems
9973	Desktop Mike or 9974 Headset Mike 89.
9976	VoiceLink 199.
9975	Voice Navigator II 549.
7	Bogas Productions 60 day MBG
9279	Studio Session MIDI Utility 1.0 59.
	Super Studio Session w/Music Library 99.

	Bright Star Technology
6093	@interFACE 1.0 \$249.
	Coda Music Systems
8188	MusicProse 2.1
5604	O Finale 2.6.1
	Computer Friends
8271	• ColorSnap 32 + 1.1 649.
	Electronic Arts
1846	Deluxe Music Construction Set 2.5 . 84.
8999	Deluxe Music Recorder 99.
7	Farallon Computing 30 day MBG
6770	MacRecorder Voice Digitizer 2.0.3 104.
2199	MacRecorder Sound System 2.0.3 174.
6766	MediaTracks
6767	MediaTracks Multimedia (CD-ROM) 345.
	Full Logic Studios
1163	Mac-Sound (241 sound effects) 79.
7	Great Wave 30 day MBG
2271	Concertware & MIDI 5.1 98.
7	MacroMind 30 day MBG
9353	MediaMaker 1.0 489.
6159	MacroMind Accelerator 2.0 125.
5087	MacroMind Director 3.0 (July '91) 629.

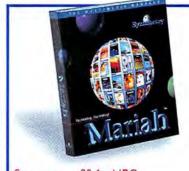


1596 MacRenderMan & Show Place Bundle—
Create photographic-quality images with the
most advanced rendering software available
as you automatically process scenes into
full color pictures. A complete picture
creation package \$649

*	Paracomp 30 day MBG
7839	
	Passport Designs
8253	@TRAX 2.0.1
8254	Desktop Music Creativity Kit 1.0 189.
8255	Desktop Music Creativity (CD-ROM) 189.
8607	Music Production Kit (CD-ROM). 1249.
3117	Master Tracks PRO 4 4.5 315.
8250	@Encore 2.0
3115	MIDI Interface
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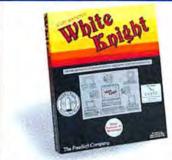
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American Heritage Electronic Dictionary

The American Heritage Electronic Dictionary (AHED) is a reference and writing tool based on the office edition of the American Heritage Dictionary. The package is a real-world example of hypertext that beats thumbing through conventional dictionaries. Its interface is somewhat clumsy, however, and the program doesn't integrate well with other applications.

The AHED contains complete dictionary entries for more than 116,000 words and incorporates the Roget's II Electronic Thesaurus, which provides 500,000 synonyms for more than 42,000 words.

The AHED package comprises four 800K disks. The contents are compressed as a segmented DiskDoubler file, so you must first join and expand the segments. You place the ten resulting files (3 megabytes on-disk) in your System Folder. Although this method of installation is not exactly difficult, it would be nice if the program automated the process and reduced the number of resulting files.

Once installed, the AHED is available as a DA. When you select it, an AHED menu appears at the right of the application's menu bar. To activate the program, you select Choose Dictionary from the AHED menu, type a word in the text field, and click on Lookup. The DA searches the dictionary files for the appropriate definitions and displays them almost instantaneously. Just as with a printed dictionary, you get hyphenation points, pronunciation, parts of speech, inflections, etymology, and usage notes in addition to the definition. The thesaurus works in a similar fashion.

You can double-click on almost any word in the dictionary or thesaurus to look up its definitions or synonyms. The DA keeps track of your last 16 inquiries, and you can backtrack via a pop-up menu. You can have up to 15 windows open simultaneously.

If you're trying to look up a word that's spelled incorrectly orisn't in the dictionary, the program suggests alternatives based on phonetic and typographic-correction algorithms. You can search the dictionary by using wildcards that represent single

or multiple characters — a real boon to crossword-puzzle fanatics and poets in search of just the right word. Additionally, the Anagram feature finds words that have the same characters arranged in different order.

SearchText is a powerful AHED feature that finds words based on definition, vague meaning, or related concept. For example, using Boolean expressions, a search for the words *gold* and *coin* returned the words *doubloon*, *eagle*, *guinea*, and *sovereign*.

The AHED has on-line help and is backed by toll-free technical support. The product is bundled with a helpful writers' guide and comes with a 60-day moneyback guarantee.

Unfortunately, the AHED's clumsy interface doesn't win any points for convenience. Most importantly, the program doesn't integrate well with other applications. For example, AHED doesn't automatically default to a word on the Clipboard and there are no hot keys for invoking features. Another complaint is that you can't cut and paste definitions into your documents.

But these shortcomings aside, we found the AHED to be a useful reference tool that is truly superior to a printed dictionary for Mac users.

Houghton Mifflin, 1 Memorial Drive, Cambridge, MA 02142; (800) 633-4514 or (617) 252-3000. Version 1.0. \$89.95.

Owen W. Linzmayer



The Rite of Spring

With the release of The Rite of Spring, The Voyager Company has raised CD-ROM technology to a higher plateau. The Rite is the latest entry in Voyager's CD Companion series, a CD-ROM and HyperCard-based exploration of classical music. Beethoven's Ninth was an impressive first in the series, but The Rite of Spring represents a significant reassessment of how CD-ROM programs should work.

Stravinsky's *The Rite of Spring* has always been a mystery to all but the most educated of music scholars. Voyager's product, which features a rip-roaring performance by Charles Dutoit and the Montreal Symphony, finally unlocks many of the work's musical mysteries and lays them bare for music afficionados and first-time listeners alike.

The accessibility of Voyager's product is due, in large part, to the written and aural contributions of author and National Public Radio personality Robert Winter. It is Winter's gift of lucidity that makes The Rite such a joy to use.

The Rite program consists of eight sections: The Pocket Guide provides a single-screen overview of the entire piece, enabling users to hear any individual section instantaneously by clicking on it. Stravinsky's Orchestra and Stravinsky's World illuminate the influences on the composer as he wrote the piece and explain how he used orchestral forces in unusual ways. The Rite as Dance describes the balletic aspect of the work.

In the Rite Listening section, the music really comes alive. This section clarifies the stylistic, rhythmic, structural, and harmonic elements that make *The Rite of Spring* sound as modern today as it did when it was first performed 78 years ago.

The Close Reading section analyzes the piece in real time. At any time during the playing of the piece, you can pause and refer to linked cards in either the Rite as Dance or Rite Listening stacks or in a stack called A Closer Look, whose cards contain written score samples. You can choose to play either the orchestral version of the sample or an instrumental solo. (Hundreds of fragments of The Rite played by individual instruments are also on the CD-ROM.)

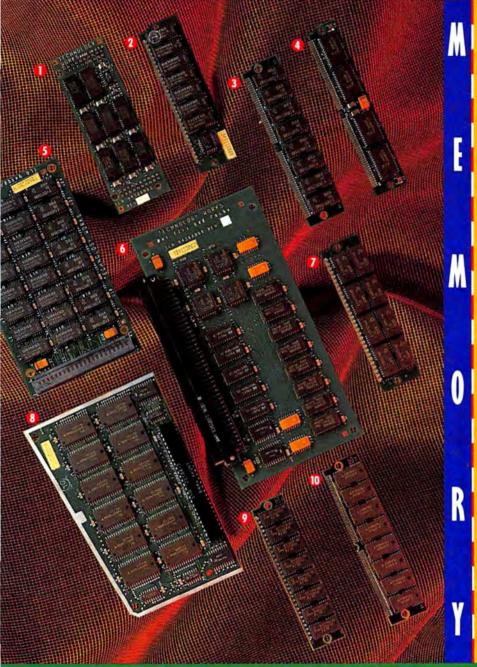
And finally there is The Rite Game, which draws on all the information presented in the package using new Hyper-Card 2.0 routines.

A help feature on the order of System 7.0's balloon help is available at all times in the program, and pop-up captions appear when the cursor passes over certain items. A Glossary function is also available. When turned on, the function underlines words that have Glossary entries. If you click on an underlined word, you get a definition and, in some cases, an audio example. There are also scanned drawings on every card, complete with captions, and title cards even contain animation routines.

Although it's black-and-white, the stack itself has real style, thanks in part to the use of Adobe's Frutiger font, which is included and must be installed first. The Retrace and Find functions are also well designed.

If you love music or just want to see what first-rate HyperCard programming is all about, get The Rite of Spring. It's the

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Ken Gruberman



If you're a longtime reader of MacUser, you've probably noticed that the acronym MIDI (musical-instrument digital interface) appears frequently. If, like 99 percent of the public at large, you still don't know MIDI from XCMD, worry not: Help is at hand. Opcode Systems' The Book of MIDI is a HyperCard primer that promises to enlighten even the most digitally dysfunctional.

The Book of MIDI was designed to be useful to MIDI novices as well as to MIDIphiles. The stack covers all the basics of MIDI, from the creation of the specification in 1983, to descriptions of MIDI studio setups and MIDI hardware and software, to the intimate details of MIDI messages.

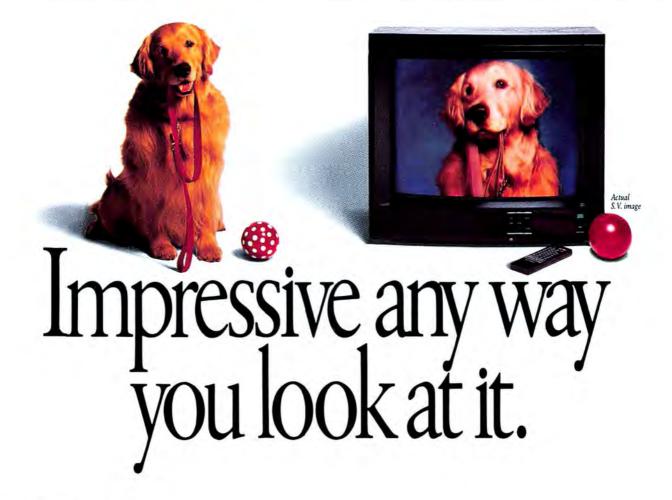
You can operate the stack on two levels. If you're a novice, we recommend that you explore the first level, where the basics are described in a nonthreatening way. If you're past the elementary stage or are interested in specific details and subjects, you'll want to explore the second, more technical, level.

Especially useful is the tour of potentially confusing MIDI setups. Sure, you understand that Box A is supposed to make a sound, Box B is designed to amplify the sound, and Box C is responsible for telling Box A which sound to play. Fine. Meanwhile, you've got 34 cables, all of which seem to have different connectors, clutched in your sweaty hands. How does this stuff hook together? Open the Book of MIDI, and go directly to Chapter 2, Setting Up Your MIDI Studio. Follow the steps, and your MIDI setup is done in no time.

For more-experienced MIDI users, the chapter detailing MIDI messages is also welcome. And let's face it - even MIDI pros need a reminder of common MIDI hexadecimal and binary codes. The MIDIimplementation-chart walk-through is also quite good.

So what's not to like? Although The Book of MIDI is a fine reference source as well as a darn good HyperCard stack (the scripting alone may be worth the price), it's marred by too many plugs for Opcode products. Opcode goes so far as to include minidemos of its MIDIplay and EZ Vision products. Enough already.

But this annoyance aside, The Book of MIDI is a good starting point for MIDI beginners. And even experienced MIDI users can benefit from the Book as a reference for common MIDI messages and code. When you're ready for more advanced information, you can take a look at The Book's bibliography, which lists some of the best sources of information available on MIDI. Perhaps if enough Macintosh users become MIDI-literate,



the acronym will cease to be an enigma.

Opcode Systems, 3641 Haven Dr., Suite A, Menlo Park, CA 94025; (415) 369-8131. Version 1.0. \$39.95.

- Christopher Breen



RoboSport

Billed as a thinking man's shoot-'emup game, RoboSport is actually a battle-strategy simulation that pits teams of robots against each other in a variety of metal-crunching sports events. You can choose from more than 2,100 preset battles, but what's really interesting about RoboSport is that you can also program the actions of your robots with a simple point and click of the mouse. Unfortunately, as fascinating as this sounds, the process itself turns out to be more tedious than satisfying.

RoboSport gives you a robot team that competes against one, two, or three human or computer opponents. Players take turns on a single Macintosh, on different machines connected serially or by modem (300 to 19,200 bps), or on an AppleTalk network.

The teams of robots do battle in five sports: survival (whoever lives, wins), capture the flag, hostage, treasure hunt, and baseball.

For each game, you choose the sport, composition of the teams, game length, and arena. Each turn is then broken into Edit and Movie modes. In Edit mode, you program individual robots, using the mouse and simple icons. There's no programming language or syntax involved. For example, you click where you want a robot to go or select a weapon from the arsenal and click on a target.

After you have programmed all the robots on your team, you enter Movie mode, where the computer generates a movie based on the actions you and your opponents have specified. Using VCR-like controls, you play the movie and watch from an overhead viewpoint as the results of each turn unfold in real time.

Robots charge across the battlefield, hunker down in ambush, take potshots at one another, lob grenades, and generally get blown into scrap metal.

The terrain in various arenas provides protection from enemy scanners and weapons, but unfortunately the landscape detail makes the robots and their actions difficult to see on monochrome as well as color systems.

In concept, RoboSport is intriguing, but all the programming, waiting, and modality becomes extremely tedious and distracting, especially in multiplayer battles. And we don't recommend playing RoboSport on computers connected by modem — the games are intolerably slow.

If you're a Mac aficionado with the patience of a programmer and lots of time on your hands, you may love RoboSport. But if fast action is your idea of a good time, we suggest that you look elsewhere.

Maxis, 2 Theater Square, Suite 230, Orinda, CA 94563; (800) 336-2947 or (415) 254-9700. Version 1.00. \$59.95.

— Owen W. Linzmayer





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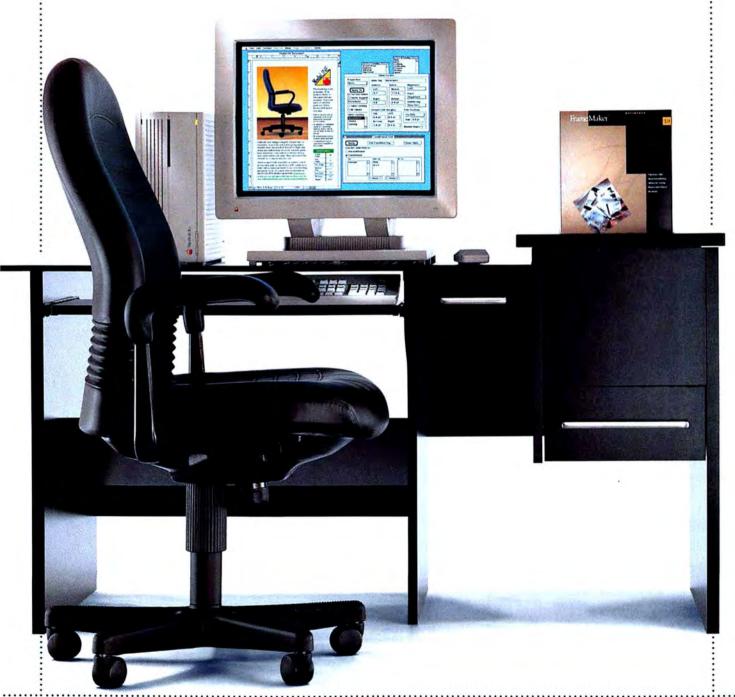
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PUTTING YOUR MAC ON TV: Desktop Video

Make your Mac a
TV star! We test
six ways to put a
TV studio onto
your desktop—
and discover a
surprising top
performer.



ant to be the next Ted Turner? Maybe your Mac can help. But does the Mac have the power to make desktop broadcasting as ubiquitous as desktop publishing? This month MacUser Labs dissects six top Mac desktopvideo products and discovers that CNN is safe — for now.

Although Mac desktop video can't deliver broadcast-quality television, it's more than adequate for most business and educational uses. You can, for example, easily record any Mac presentation and take a videocassette along on sales trips instead of lugging your Mac. What's more, because you can easily make multiple copies — complete with stirring music and authoritative narration — you can mail your presentation to clients in cities you don't get around to visiting. Some of the products we tested also let you mix video with Mac-generated graphics, so your company's training videos can include the smiling face of your orientation specialist — complete with her name on the screen, just as on the nightly news — along with screen recordings of the Mac software she's demonstrating.

The Mac is a great tool for creating information, and video is an ideal medium for its distribution. Desktop video — often called DTV — brings the two together. Last month we looked at one aspect — displaying broadcast, videotape, or videodisc images on your Mac's screen (see "The Mac/TV Connection: Desktop Video," July '91, page 124). This month we look at DTV from the opposite angle — putting your Mac's display onto a TV screen or onto videotape.



BY
PAUL YI
AND THE
MACUSER LABS
STAFF





A Toast to the Toaster

Although we found that no Mac DTV product is yet ready for prime time, we did discover a non-Mac video product that is: the NewTek Video Toaster. The Toaster comes in two flavors: the original card, which turns a Commodore Amiga 2000 or 2500 computer into a desktop-video-production studio, and a new stand-alone Video Toaster computer based on an Amiga motherboard. Both offer the same impressive list of features.

The Video Toaster takes NTSC video input from different sources, overlays graphics, manipulates the combination with any one of many special effects, and then outputs broadcast-quality video. No Mac product comes close to the Toaster's quality and versatility — and certainly not to its price: The card retails for \$1,595, and the Toaster computer costs \$3,995.



Mac developers are working on ways to integrate the NewTek Video Toaster with Mac applications.

With either setup, you can bypass the Amiga operating system and deal directly with the Toaster interface. Although the Toaster's interface is less friendly than the Mac's, it is straightforward and the manuals are complete and instructive, unlike the manuals we've seen from some of the Mac video companies.

The Toaster's feature list is impressive. First, the Toaster is a four-input switcher with more than 100 transition effects: flips, tumbles, rolls, fades, wipes — and more on the way. All effects are created in software, so upgrades require only a simple download to the hard disk. The LightWave 3-D animation package offers wire frames, shading, and ray tracing in 24-bit color for output to videotape. You can also overlay titles onto live video with the Toaster's built-in character generator. And wait, there's more: a 24-bit painting program, chroma-key effects, and animation capabilities.

The Video Toaster computer — an Amiga motherboard, 5 megabytes of memory, and a 52-megabyte hard-disk drive — includes new software that can also read Mac PICT and EPS (Encapsulated PostScript) files and convert them into video. The Video Toaster still lacks device control and software to integrate the entire video-production process, but nothing we've heard of can match the Toaster's price and performance. We can only hope that developers will someday combine the powers of the Mac and the Toaster and give users the ultimate in DTV.

The first essential piece of DTV hardware is a NuBus card or external box that converts Mac video into television video. We found six products for the Mac that accomplish this task and compared them with the reigning champion of DTV, the NewTek Video Toaster — a card that turns the much maligned Commodore Amiga into a surprisingly powerful studio-in-a-box (see the "A Toast to the Toaster" sidebar).

Three of the Mac-based products—
the Generation Systems TV Board, the
Generation Systems TV Box, and the
RasterOps Video Expander—simply
turn a Mac's video signal into a TV
signal. The remaining three—the

Mass Microsystems Color Space IIi and FX (two NuBus cards that work together), the RasterOps ProVideo 32, and the Truevision NuVista+ — also offer special effects: They take a TV signal, overlay and blend Mac graphics with it, and output the result to a TV or a VCR. For video production, you need additional equipment such as videotape recorders, hardware to control the VTRs, and software (see the "Mac Video Production" sidebar).

After we had installed all six videoout products in a NuBus-equipped Mac
— not an easy chore in some cases —
we put them through an exhaustive set
of MacUser Labs video benchmarks.
We discovered that the big differences

among them were not in the quality of their video output — none even approached broadcast quality — but rather in how easy they were to use, how powerful was the software that each vendor supplied, and how much help their manuals offered.

Not Ready for Prime Time

If you want to show your Macproduced video on NBC, you'll have to go to a video service bureau that specializes in Mac-video-to-TV-video conversion. A service bureau uses industrial-strength video equipment called encoders and time-base correctors to bring your tape up to the tight voltage and timing specifications that define a broadcast-quality signal.

The U.S. TV standard signal — also used in Canada, Japan, and South America — is called an NTSC (National Television Standards Committee) signal and includes 525 interlaced lines of video per frame at 30 fps (frames per second). An interlaced frame is made up of two separate but overlapping fields, with each field containing alternating lines of the image. Each field is displayed at 60 hertz; that is, it's drawn and redrawn 60 times per second. Because two interlaced fields are required to make up one image, the image is completely redrawn 30 times per second.

Mac video, on the other hand, uses noninterlaced, single-field video running at 67 to 82 fps to create an image that's crisper and more flicker-free than NTSC can achieve.

All six DTV products we evaluated convert Mac video into NTSC video. The three products that can produce overlays and effects can also convert NTSC video into Mac video, manipulate the Mac video image, and then convert it back into NTSC video. They do all conversion in real time, so anything you can do on your Mac can be merged with a video input and captured on videotape.

NTSC video comes in three popular flavors (see Figure 1). The most common is *composite* — a one-channel signal used by most consumer-

level video equipment. Another widespread version, of intermediate quality, is *S-video*, used in semipro equipment such as Super-VHS and Hi-8 cameras and recording and playback decks. The highest-quality NTSC-video signal is a three-channel component signal called an *RGB* signal, which is used in professional video gear.

Because of its popularity, we chose to test the quality of each Mac DTV product's composite NTSC signal. A Tektronix VM700TV-signal analyzer showed us that none of the products achieved NTSC-level signal quality, although the Truevision NuVista+came closest (see Figure 2). The NewTek Video Toaster, on the other hand, easily met NTSC specifications.

An NTSC RGB signal is of higher quality than any composite signal, but an RGB signal can't be played on consumer-level VCRs. RGB signals can be converted into single-channel composite signals through a process called *encoding*, but this conversion may introduce noise and timing errors unless you use a professional — and expensive — encoder. For the best DTV quality, find a video service bureau that can do the job.

The Truevision NuVista+, Mass Microsystems ColorSpace IIi and FX, RasterOps ProVideo, and RasterOps Video Expander output three-channel RGB signals in addition to composite video. The Generations Systems TV Board and TV Box output only composite signals. The RasterOps ProVideo 32 and Video Expander and the Truevision NuVista+ also output S-video signals. The Video Toaster outputs only composite signals, but they're of broadcast quality, so there's no need for an RGB output.

Mac In-House Videos

Although a Mac-produced video will never be good enough to air on MTV, don't be disappointed: There are plenty of ways DTV can streamline and enliven your business presentations, train and inform your employees and clients, and add titles and graphics to your current video collection — once you've figured out how to install and use the product of your choice. And, as is often true with a technology that has not yet fully matured, the more powerful the DTV product, the harder it is to master.

The three products that simply put your Mac's display onto a TV screen or videotape are all easy to set up and run. The Generation Systems TV Box and the RasterOps Video Expander work with Apple display cards. The Video Expander also works with RasterOps display cards that drive a 13-inch AppleColor High-Resolution RGB Monitor. Neither work with Mac

Late Arrivals

Two inexpensive new products didn't arrive at MacUser Labs in time for testing. At \$599, the Mass Microsystems EasyVideo 8, a NuBus card that turns 8-bit Mac video into NTSC video, seems a bargain — but it's the same card used by Generation Systems for its \$395 TV Board. Mass Microsystems, 810 W. Maude Avenue, Sunnyvale, CA 94086; (800) 522-7979 or (408) 733-5499.

Computer Video's Video NTSC Encoder (\$395 list, \$335 direct) is an external box similar to the Generation Systems TV Box that takes output from video cards that drive an Apple 13-inch monitor and converts it into an NTSC signal. Unlike the TV Box, however, the Encoder can't switch the active screen from TV to Apple monitor. Computer Video, 215 Salem Street, Suite 5, Woburn, MA 08101; (617) 937-0888.

internal video from the IIci, IIsi, or LC. Both are external boxes, and both support 24-bit-color cards. To install them, you simply plug the video cable from the Macintosh video card in to the boxes.

The TV Box has a connection for a video cable to an Apple monitor. A switch on the front of the TV Box lets you select the TV or the computer monitor as the active screen; the nonactive display — the TV or the Mac monitor — goes blank. The

Figure 1: The Three Types of NTSC Video



Composite: The one-channel composite signal is the most common video signal. Composite cables use either an RCA or a BNC connector.



S-video: The two-channel S-video signal is used in Super-VHS and Hi-8 VCRs and cameras. S-video cables use a four-pin connector that looks identical to a Mac ADB connector.



RGB: The least common signal, threechannel RGB, is used in professional video equipment. A component cable has four BNC connectors: one each for the red, blue, green, and sync channels.

Figure 1: Desktop-video products use one or more of these three most common video signals.



Mac Video Production

To produce desktop video with your Mac, you need more than a NuBus card or an external box that converts Mac video into TV video. For starters, you need (1) a videotape recorder (VTR), a videocassette recorder (VCR), or a videodisc player and (2) a camera or a camcorder. You also need device controllers and software to integrate your DTV production. Our recent "MacUser Multimedia Encyclopedia" (February '91, page 105) gives a complete overview of all the necessary pieces — but there are some recent developments worth noting.

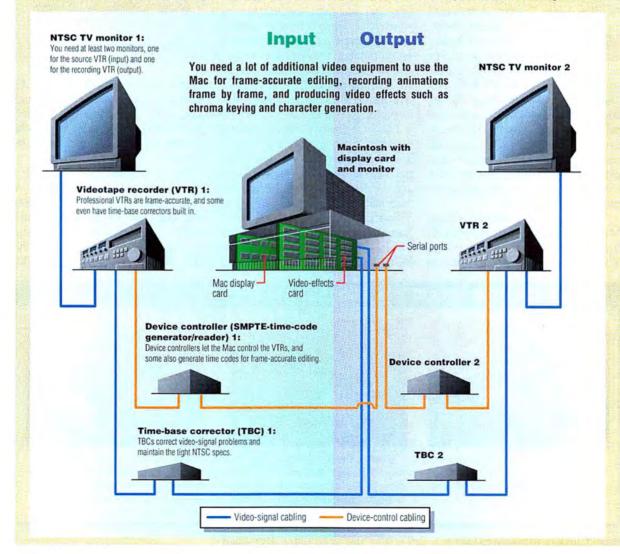
Sony's new Vbox (\$249.95) controls most Sony consumer-quality cameras, camcorders, VCRs, and even TVs. About the size of an external floppy drive, the Vbox

connects to a Mac through the printer port or the modem port. One Vbox can control 1 device, but a chain of 7 Vboxes can be connected to each port — letting one Mac simultaneously control up to 14 devices. As soon as developers write the appropriate software, you'll be able to zoom in with a camcorder, pause and record with a VCR, and raise or lower the volume on a TV, all under Macintosh control. Sony Corp., Sony Drive, Park Ridge, NJ 07656; (201) 930-6432.

The Vbox offers control of consumerquality cameras and VCRs, but consumer video equipment is notoriously imprecise. For accurate frame-by-frame control, you need professional VTRs and more-powerful controllers. You also need what's called SMPTE time code — a way of indexing frames of video with numbers so that you can accurately edit video or record Mac animations frame by frame.

MacUser's February Multimedia Encyclopedia listed several frame-accurate device controllers from Advanced Digital Imaging, Diaquest, and Videomedia. Another source is ARTI (Advanced Remote Technologies, Inc.), which sells external boxes called ARMs that control professional VTRs. All the products generate SMTPE time code and support frame-accurate VTRs. ARTI, 307 Orchard City Drive, Suite 204, Campbell, CA 95008; (408) 374-9044.

Digital F/X offers an integrated video



system called the Video F/X, an external box with a NuBus card, which controls two or three VTRs. The Video F/X also inputs and outputs video to and from the Mac through the NuBus card — as do the products described in this report. The Video F/X is unique, however, in being able to convert PostScript — both text and graphics — images into analog video. It also generates SMPTE time code. New software enhancements in version 2.0 offer nonlinear editing with full-motion digital video and optional A/B edits — mixing two different sources, complete with fades and wipes — and PICS-animation support.

Although the Video F/X 1.0 digitized only the first and last key frames of an analog-video segment, the new version uses compression to digitize full-motion video and audio for storage on your Mac's hard disk. The quality of the digital video is good enough to print to videotape. You can use an edit decision list— a list of edit points—created from your digital edits to assemble the final tape from the original videotapes. The Video F/X retails for \$9,995, with A/B-roll and PICS-animation support as options at \$3,000 and \$1,000, respectively. Digital F/X, 755 Ravendale Drive, Mountain View, CA 94043; (415) 961-2800.

For the ultimate in Mac digital-video production, choose the Avid Media Composer Series. The original Avid/1 Media Composer was the first system to offer full digital editing, but its 8-bit dithered Mac video image wasn't professional. The new Composer Series products use JPEG (Joint Photographic Expert Group) compression to digitize full-motion video in full color.

The Avid Media Composers are Mac video workstations, complete with a Mac Ilfx, Truevision NuVista+, compression board containing the C-Cube CLC-550 chip. Videomedia device controllers, sounddigitizing boards, and plenty of magnetic storage. Avid software integrates all the elements: With it you can perform digital editing, prepare edit decision lists, create titles, print to videotage, and layer and mix multiple tracks of digital sound. Seven models are available in the Avid Media Composer Series, starting at \$24,500 and topping out at \$69,500; the high-end models have higher-quality digitizing and additional digital-audio features. Avid Technology, Inc., 3 Burlington Woods, Burlington, MA 01803; (617) 221-6789.

RasterOps Video Expander, on the other hand, doesn't have an output for an Apple 13-inch monitor. Once the video cable has been plugged in to the box, you have no choice of TV or Mac-monitor display: The TV takes over. To return to the Mac monitor, you have to disconnect the box and reconnect the cable from the display card back to the Apple monitor — a real nuisance if you need to switch back and forth frequently.

When you're using the TV screen as the display, neither box can display the menu bar or any icons on the edges of the Mac screen, because the NTSC video frame isn't big enough for the full frame — 640 x 480 pixels — of an Apple 13-inch monitor, Neither box offers the solution used by the Generation Systems TV Board and the three effects cards: an underscan output mode, which compresses the NTSC image so that it can fit the entire Mac desktop, menus and all, onto a TV screen. The resolution of the underscan video mode varies with the other products, but all manage to show the entire desktop.

The TV Box outputs a single video signal — composite — whereas the Video Expander outputs each of the three most-popular types: composite video, S-video, and RGB. The Video Expander also has inputs for an external signal that allow it to be *genlocked* — electronically synchronized — with other video devices. Without genlocking, a TV image rolls or shows interference patterns when mixing video signals from different sources.

The other DTV products — the Generation Systems TV Board and the three effects and overlay cards — all fit into the NuBus. Installation of the TV Board is simplicity itself — just plug it in to a NuBus slot, and you've got instant composite NTSC video available from the RCA-style connector on the rear of the card. The TV Board supports up to 8 bits, and because it acts like any other 8-bit Mac display card, it shows up in the Apple Monitor control panel. The only difference is that instead of showing Mac video on

a 13-inch Apple RGB monitor, the TV Board shows it on a TV.

The three effects and overlay systems — the RasterOps ProVideo 32 card, the Mass Microsystems Color-Space cards, and the Truevision NuVista+ card — provide both interlaced NTSC-video and noninterlaced Mac-video output, Like the TV Board. the three cards show up in the Apple Monitor control panel. You can connect their NTSC output to a VCR and record it. If your television or VCR has a video-pass-through feature, you can record and view at the same time. The three video-out cards are also Macvideo-display systems that can run a 13-inch AppleColor High-Resolution RGB Monitor. You can't, however, see the video on an Apple monitor and a TV at the same time. You set the active mode - either Mac video or TV video - with a software driver for the NuVista+ and through the Monitor control panel for the ColorSpace cards and the ProVideo 32.

If your video experience amounts to connecting a TV to a VCR, much of the struggle of using an effects and overlay card will be plugging everything in. The RasterOps ProVideo and Truevision NuVista+ make your chore easy, because they are single NuBus cards. The Mass Microsystems Color-Space product comprises two separate NuBus cards: the ColorSpace IIi, a stand-alone 8-bit-video card, and the ColorSpace FX, which provides NTSC conversion and special effects.

The two ColorSpace cards, introduced in 1989, were the first Mac video-effects cards. Unfortunately, their manuals (the same user guide and reference manual are used for each card) are still labeled "preliminary" on the front cover — and it gets worse when you open them. For example, there are references to figures that are "to be drawn" — omissions that are inexcusable in light of how difficult both ColorSpace cards are to install.

For example, when you connect the two ColorSpace cards by using the supplied cable, it's difficult to ascertain whether you've installed the



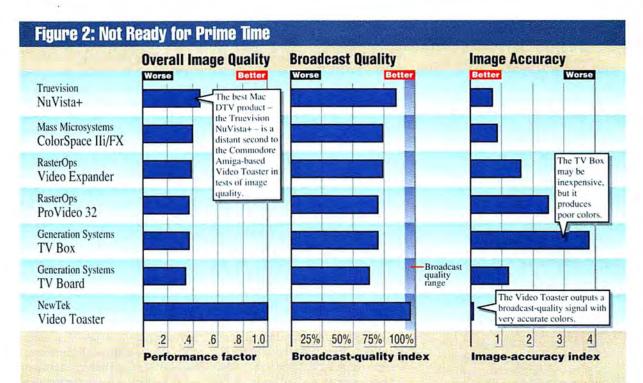


Figure 2: Mac desktop video (DTV) is fine for presentations and in-house training videos, but don't expect to use your Mac to produce the next hit MTV video — Mac DTV quality simply isn't good enough.

Overall Image Quality:

Overall image quality is a combination of how closely each DTV product approached broadcast-quality signal specifications and how accurately it converted the Mac's digital color signals into NTSC signals. We compared each product with the Commodore Amiga-based NewTek Video Toaster—a DTV product that easily outperformed the best Mac card, the Truevision NuVista+.

Broadcast Quality:

We weighted nine NTSC-signal-quality specifications to create an index that defines an acceptable broadcast-quality signal according to industry standards. On our index, a 100-percent signal is a perfect broadcast signal and a 90-percent signal is acceptable. None of the Mac products comes close to matching the NTSC's tight voltage and timing requirements. The NewTek Video Toaster, however, shows that you can get broadcast-quality video from an inexpensive desktop computer.

Image Accuracy:

We created a file containing a set of

industry-standard colors — called SMPTE color bars — to see how far the colors shifted during their conversion from Mac video to NTSC video. We created an image-accuracy index by combining the measurements of various image elements such as color accuracy and brightness and measuring how far each product deviated from this ideal. Of the Mac products, the NuVista+was the most accurate. The Generation Systems TV Box, on the other hand, showed colors that were grossly shifted from the Mac-video colors. The NewTek Video Toaster shows how little error a broadcast-quality DTV product adds to the conversion.

cable's five-pin connectors in the right orientation. Also, none of the ports — two on the FX and three on the IIi — is labeled. After much thumbing through the "preliminary" manual, we discovered that all three RCA connectors on the IIi card are NTSC inputs and that the ColorSpace software lets you select which is active. Mass Microsystems should be crowing about this powerful feature — with it you can monitor three active video sources — rather than burying it in its obscure manual.

Mass Microsystems told us that it

has no plans to update the ColorSpace manuals, however. Although the ColorSpace cards were the first on the scene, they now seem poised for early retirement: They have been drastically reduced in price, down to \$2,495 from their original list price of \$5,798.

One of the two manuals shipped with the RasterOps ProVideo 32 is also labeled "preliminary," but the ProVideo 32 is a single NuBus card and installation in the Mac is straightforward. The connecting cables are labeled "input" and "output" — very helpful when you're fiddling around

behind your Mac to attach them. You receive no help from the manual about how to set up video devices such as VCRs, videodiscs, and camcorders, however.

Owners of the Truevision NuVista+ will find that its two helpful manuals ease installation and use. The setup manual shows step-by-step illustrated instructions on how to install the card and on how to connect various video devices. We congratulate Truevision for making the process clear and straightforward — both novice users and the most experienced videophiles will appreciate the help. The thick user manual includes a tutorial and many pages of in-depth explanation of software features and capabilities.

The NuVista+ comes in three memory configurations, with increasing prices for more memory. You can have 1, 2, or 4 megabytes and can upgrade the memory at any time. More memory gives you a greater range of resolutions at full color. The NuVista+ can be set for NTSC- and Mac-video modes at a range of resolutions, including full 640-x-480-pixel and underscan 512-x-400-pixel modes the underscan mode allows all of the Mac's desktop to appear on a TV screen. The 1-megabyte version can output 24-bit color only in the underscan mode, whereas the full 4megabyte version can output full-color video in any mode. The 1-megabyte version also has limited overlay and capture capabilities on the Mac. We used a 2-megabyte version and found its abilities to be more than sufficient.

Software and Features

The Generation Systems TV Box and TV Board and the RasterOps ProVideo 32 have only limited software. They simply provide TV output of the Mac's screen—it's up to you to figure out what to do next. You can videotape presentations, animations, educational software—or just the mouse scurrying across your screen.

The Mass Microsystems Color-Space, RasterOps ProVideo 32, and Truevision NuVista+, on the other hand, offer powerful features that need software to make it all happen. One important feature all three products share is the ability to overlay - or combine - video with Mac graphics (see Figure 3). You can blend TV video and Mac graphics, controlling the transparency of each. Each card also provides chroma keying: You use the cursor to select a color in a Mac graphic, and video appears instead of that color. This lets you place text over live video and record the result: You simply create a Mac graphic with text on a solid background color and select

Figure 3: Special Effects



Figure 3a: The ColorSpace boards offer many ways to manipulate video, including mirroring. The demo stacks in HyperCard and SuperCard show that it can be done.



Figure 3b: The
RasterOps
ProVideo 32,
Mass
Microsystems
ColorSpace Ili/
FX, and
Truevision
NuVista+ can all
put titles onto live
video through a
process called
chroma keying.



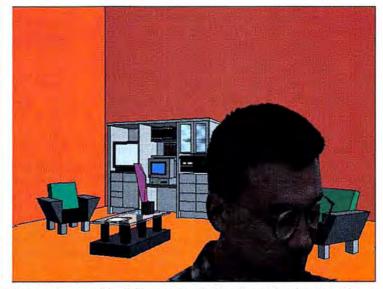


Figure 3c: The Truevision NuVista+ is the only Mac video product that can overlay Mac graphics onto a video signal.

Figure 3: Desktop video can do more than simply put your Mac's screen onto a TV screen or videotape. Three overlay and effects cards can also provide impressive video effects.



Apple's QuickTime

In last month's "The Mac/TV Connection: Desktop Video" (page 124), we mentioned that a new Apple System-software extension called QuickTime would help digital video become a reality. We're now willing to make an even bolder prediction: QuickTime will do for multimedia what 32-bit QuickDraw has done for color and desktop publishing. With QuickTime's help, the Mac will become the premier multimedia computer of the '90s — and beyond.

QuickTime is Apple's architecture for handling "dynamic media" digital video and audio — and external devices such as digitizing cards and video devices. It's the first extension to System 7.0 software and is also backward-compatible with System 6.x. QuickTime manages the playing of digital movies and the compression of still images, animations, and digital video. It also defines a new file format called MOVIE, the first significant format to come from Apple since PICT. MOVIE is a format for animation and digital video that can also have tracks of digital audio and external hooks such as MIDI. You can cut, copy, and paste a MOVIE document as you can with any other Mac file format. The MOVIE format also contains a tempo map that takes its timing from the Macintosh's internal crystal clock. With QuickTime's help, MOVIE files can play at the same speed on a llfx and a Classic. MOVIE is designed as a cross-platform format so it may become an industry-standard way of communicating digital multimedia information.

Apple has used some elements of QuickTime to revamp the PICT format, adding extensions for compression and preview. The new PICT format can save a 4K or 5K thumbnail of an image that an application can easily call for previewing without having to load the entire image into memory. This can save substantial time, because a full-page 24-bit-color image can be as large as 20 megabytes.

Compression is one of QuickTime's most radical advances. QuickTime includes three schemes: The Photo Compressor puts the industry-standard JPEG (Joint Photographic Expert Group) compression algorithm inside Apple System software, allowing PICT files to be saved in JPEG format. The Animation Compressor squeezes PICS animation files — a series of linked PICT files. The Video Compressor uses a proprietary algorithm to compress live analog video as it's converted into digital form. Providing compression in System software means that every Mac can have access to digital video, although Macs with monochrome displays will have severely

limited image quality. For those who want the faster and better-quality compression offered by a NuBus card, QuickTime can sense any installed third-party hardware compression system and switch to it.

QuickTime should be available by the end of the year, and products are already in the works to take advantage of it. For example, SuperMac's VideoSpigot (\$499) is a board for the Mac IIsi and LC that uses QuickTime's Video Compressor to capture and play back fullmotion video and audio in a small window. With a camcorder and the VideoSpigot, you can record directly to your hard disk. The VideoSpigot uses the Ilsi's and the LC's built-in internal video. The Video Spigot Pro (\$1,899), for the Ilsi, is a video- and audio-digitizing card and an accelerator/color-graphics card. The VideoSpigot Pro drives large screens in 8-bit color and small screens in 24-bit color, all accelerated. SuperMac also plans to bundle with both boards a powerful editing program called ReelTime, which lets you edit digital video and audio, mix Mac graphics, and add transitions such as wipes and dissolves. You can save ReelTime creations in the MOVIE format, and word processors, spreadsheet programs, and database programs can play your MOVIE documents on any Mac running QuickTime. SuperMac, 485 Potrero Avenue, Sunnyvale, CA 94086; (408) 245-2202.



With SuperMac's ReelTime software, you can edit digital video and audio, complete with special effects.

the color as the chroma-key color; live video then shows behind the text.

The Truevision NuVista+ can also accomplish the reverse: chroma keying Mac graphics onto a specific video color. This is a common technique, used for creating the familiar illusion of a TV forecaster in front of a weather map. The forecaster is actually standing in front of a blue screen, and a weather graphic is displayed instead of the blue background color. It is also the technique used in films such as *Star Wars:* All those careening spaceships were shot in front of a blue screen, and the background of stars

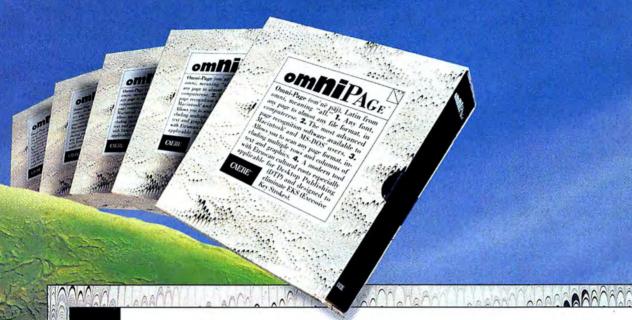
and planets was added later.

The RasterOps ProVideo 32 ships with the simplest software, a single DA called SFX, which provides blends, overlays, and chroma keys. You can run a Mac application and still have access to the card's features through the DA, but the DA alone lacks the power to do anything beyond simple overlays and blends. RasterOps is working on hooks to HyperCard and MacroMind Director — in the form of XCMDs and XOBJs, small pieces of code that allow HyperCard and Director, respectively, to control hardware devices. For the present, however, you

are limited to just the DA.

The Mass Microsystems Color-Space IIi and FX come with the application MacTV, which provides a live-video window in full or quarter size; a DA that digitizes single frames of video; and a DA that controls the overlay of Mac graphics and video. This software only touches the surface of the power of the hardware, however. Two demo stacks in HyperCard and SuperCard better illustrate the range of possible effects — multiple video windows and animation of a video window, to name just a couple — but these are only demo stacks. Mass

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Microsystems does provide HyperCard XCMDs with a reference manual, but none of the software is helpful for average users who want to use the card out of the box without learning to program.

The Truevision NuVista+ comes closest to delivering a complete video solution. Five control panels control input, the blending of Mac graphics and video, and chroma keys. The Capture application gives users a quick and easy way of digitizing single video frames. The manual is tremendously helpful: It provides examples, a complete and thorough description of the software, and a tutorial on how to use the software. In addition to providing you with ways of using the card directly through the bundled software, Truevision also provides hooks to HyperCard via XCMDs and Macro-Mind Director via XOBJs.

We looked at a beta version of new Truevision software called Video Script that will make the NuVista+even easier to use. Video Script is an authoring application that lets you use simple point-and-click methods to create video presentations. You can create sequences of scenes with live video and Mac graphics and perform 28 transitions, including wipes and dissolves, between the two. The retail price is high—\$495—but Video Script is the easiest way to create professional video effects that we've seen any Mac video product offer.

Color Tests

As mentioned before, we first measured each product's video-signal output and compared it with NTSC specifications. The results were disappointing: None of the Mac products came close to meeting NTSC specs—but the inexpensive NewTek Video Toaster in a Commodore Amiga placed well within the composite NTSC ballpark.

We also used Adobe Photoshop to create a set of SMPTE color bars — an industry-standard set of colors used to calibrate TVs — and output the file through each product's composite NTSC output. We used a Tektronix VM700 to measure the luminance and chrominance values in the resulting NTSC signal and then computed the difference between the output and the original Mac file in terms of color accuracy and brightness.

The Truevision NuVista+produced the most-accurate images, followed by the Mass Microsystems ColorSpace IIi/FX combo (see Figure 2). Both systems were able to closely match the Mac video's colors when translating them to NTSC. The Generation Systems TV Board also did well, but it transmits only 8-bit color (or gray scale), compared with the 24-bit color provided by the other cards. (Noise and errors are reduced when fewer bits per pixel are translated from Mac to NSTC video.) The worst performer was the Generation Systems TV Box, which showed a great deviation between the colors on the Mac screen and those that appeared on the attached TV.

Desktop-Video Revolution

It's easy to put your Mac on TV or videotape with DTV. Although the television signal produced by the six Mac DTV products doesn't approach broadcast quality, it's more than good enough for producing videos for inhouse training or for mailing sales presentations to clients.

The products we tested for this report prove that the video hardware is here, and it will be only a matter of time before all the pieces start coming together. The NewTek Video Toaster proves that true broadcast quality can be achieved on the desktop, and there's no reason why Mac-based hardware can't match Video Toaster quality. When combined with the Mac's superior software interface, a Mac DTV product may someday roast the Toaster.

Paul Yi is a *MacUser* associate editor. He would like to acknowledge the invaluable assistance of Pete Nehl of Varitel Video, San Francisco, in research and testing for this report.

The Bottom Line

We looked at six pieces of desktop-video (DTV) hardware that convert Mac video into TV video and found that it's easy to put Mac images onto a TV screen or onto videotape. Although we found that no Mac DTV product can achieve broadcast quality, you can still use the best of them to turn your presentation or animation into a videotape that you can use in-house or mail to clients.

Our pick as best Mac DTV hardware product is the **Truevision NuVista+** (\$2,995 with 1 megabyte of RAM, \$3,595 with 2 megabytes, and \$4,795 with 4). In our

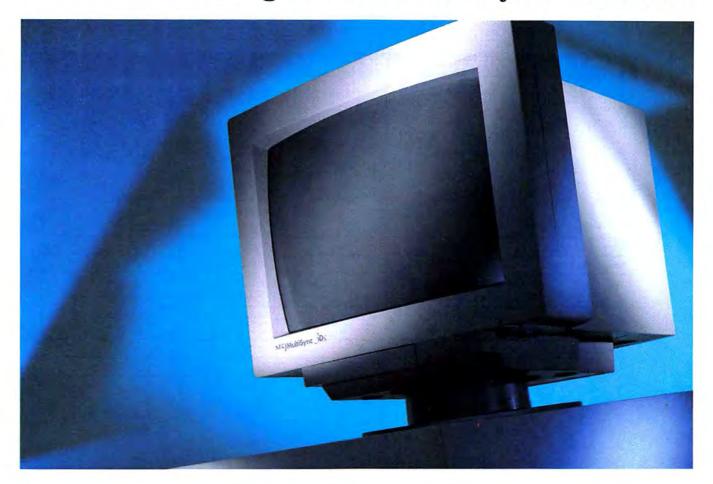
tests, the NuVista+ gave the cleanest NTSC signal of all the Mac DTV products. It offers RGB output that can be used with industrial-strength encoders, and it should be more useful for average users than competing overlay and effects cards, thanks to a complete and well-written manual that begins with a good tutorial for use of the software and hardware.

Forout-of-the-box broadcast-quality DTV production, however, you might consider a non-Mac product, the **NewTek Video Toaster** (Amiga card, \$1,595; Video Toaster computer, \$3,995), an impressive DTV system based on the Commodore Amiga. The Video Toaster provides broadcast-quality video output and features good enough for video producers to drool over — all at an unbeatable price. Although the Mac is the best thing since sliced bread as personal computers go, for DTV it's a mere crumb compared with the Toaster.



The Truevision NuVista+ is the clear choice for Mac users who want to integrate NTSC and Mac video.

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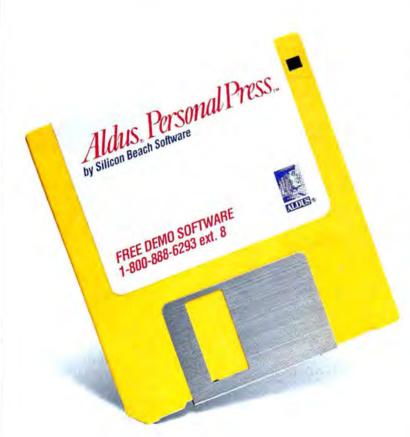




Table 1: Features of Desktop-Video-Out Products RasterOps **Generation Systems Generation Systems** Mass Microsystems TV Box ColorSpace III/FX ProVideo 32 TV Board **\$**\$\$ \$\$\$% \$\$\$% \$\$\$% List price \$395 \$395 \$2,495 \$1,995 \$395 \$1,995 \$1,750 Street price \$395 Pros Powerful video-effects engine. Chroma-key and overlay Easy to install and use. Inexpensive. Easy to install Clean 8-bit output. Drives Mac monitor and TV. effects. Cables labeled. Cons Outputs only 8-bit color Poor image accuracy. Incomplete manuals. DA lacks power. or gray scale. No software. No software. Inadequate software. No external hooks. NuBus card Hardware configuration NuBus card external box two NuBus cards Cables yes no* yes yes Video in Mac-video-card input NA 15-pin Mac RGB NA NA NTSC-video input none none composite composite, S-video Video digitizing none none 24-bit; none (no. of bits; resolution) 640 x 480 File-save formats none none PICT none Video out Mac RGB output 8-bit; 1-, 2-, 4-, 8-, 24-bit; none none (no. of bits; resolution) 640 x 480 640 x 480 NTSC-video output composite (8 bits) composite composite, RGB composite, RGB, S-video Special effects Software INITs and control panels none TV Box ColorSpace none **Applications** none none Desktop Video, SFX DA NTSC Digitizer, MacTV HyperCard XCMDs no no no yes MacroMind Director XOBJs **Technical** support toll-free, unlimited toll-free, unlimited toll-free, unlimited unlimited Warranty 1 year 1 year 1 year 1 year Company **Generation Systems Generation Systems** Mass Microsystems RasterOps 1185-C Bordeaux Dr. 1185-C Bordeaux Dr. 810 W. Maude Ave. 2500 Walsh Ave. Sunnyvale, CA 94089 Sunnyvale, CA 94089 Sunnyvale, CA 94086 Santa Clara, CA 95051 (408) 734-2100 (800) 522-7979 (408) 734-2100 (408) 562-4200 (408) 733-5499

^{*}An input/output cable is available as a \$99.95 option.

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Table 1: Features of Desktop-Video-Out Products, continued





	RasterOps Video Expander \$\$\$%	Truevision NuVista+ \$\$\$\$\frac{1}{2}\$
List price	\$695	\$2,995 (1 MB), \$3,595 (2 MB), \$4,795 (4 MB)
Street price	\$575	\$2,995 (1 MB), \$3,595 (2 MB), \$4,795 (4 MB)
Pros	Easy to use. Three types of NTSC outputs. Genlockable.	Good manual and software. Impressive live-video effects.
Cons	No Mac-monitor output. Menu bars lost on TV screen.	Expensive. Can't select input through Capture application.
Hardware configuration	external box	NuBus card
Cables	yes	yes
Video in		
Mac-video-card input	15-pin Mac RGB	NA
NTSC-video input	none	composite, RGB, S-video
Video digitizing	none	8-, 16-, 32-bit;
(no. of bits; resolution)		resizable
File-save formats	none	PICT, TGA
Video out Mac RGB output (no. of bits; resolution)	none	8-, 16-, 32-bit resizable
NTSC-video output	composite, RGB, S-video	composite, RGB, S-video
Special effects	no	yes
Software INITs and control panels	none	Blender, ChromaKey, CloseUp, MasterKeys, VIDI/O
Applications	none	Capture
HyperCard XCMDs	no	yes
MacroMind Director XOBJs	no	yes
Technical support	unlimited	toll-free, unlimited
Warranty	1 year	1 year
Company	RasterOps 2500 Walsh Ave. Santa Clara, CA 95051 (408) 562-4200	Truevision, Inc. 7340 Shadeland Station Indianapolis, IN 46256 (800) 858-8783 (317) 841-0332

Table 1 Criteria

List price - The list price is the vendor's suggested retail

Street price — The street price is a typical actual price charged by dealers or mail-order companies during April 1991. Hardware configuration - A description of the physical configuration of the product. Cables - Does the vendor provide cables for hooking up external boxes and video sources such as VCRs, camcorders, or videodisc players?

Mac-video-card input - The video connections for the external boxes.

NTSC-video input - A list of the types of NTSC-video signals the cards can accept.

Video digitizing (no. of bits; resolution) - The color depth and the resolution of the digitized video that the cards

File-save formats — The file formats in which single digitized frames can be saved.

Mac RGB output (no. of bits; resolution) - The color depth and the resolution that the cards support.

NTSC-video output - The types of NTSC video signals that can be output.

Special effects — Does the product offer special effects such as blending and chroma keying?

INITs and control panels -The startup software bundled with the product.

Applications — The bundled applications.

HyperCard XCMDs — Does the product offer XCMDs external hooks that let you control the hardware from HyperCard?

MacroMind Director XOBJs-Does the product offer XOBJs - external hooks that let you control the hardware from MacroMind Director?



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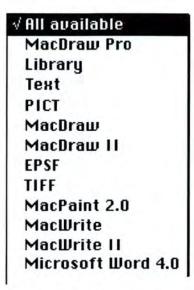
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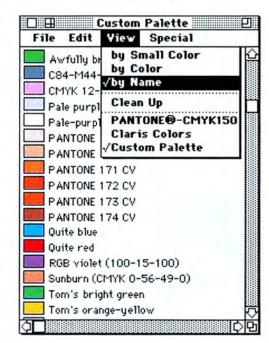
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Show your work on-screen, on overheads, or even on 35mm slides. Move slides from one file to another, and print handouts with multiple slides on each page.



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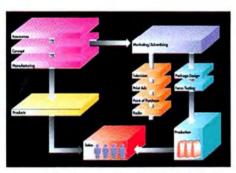
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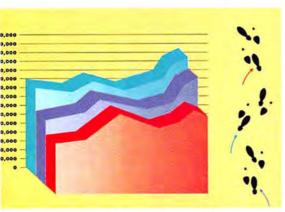
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OVERNIGHT SUCCESS: Network Backup

You've got better things to do after-hours than back up your network. We test five ways your Mac can work the night shift—so you don't have to.

ing up. That is, until that adrenaline-filled moment when you realize that last quarter's balance sheet has mysteriously vanished from your hard disk. Despite such hair-raising lessons — and hours or days of reconstructive surgery — getting your accounting department to back up routinely is still a problem. And the problem only gets larger as more Macs join your network.

But thanks to recent software and hardware ad-

here's nothing very exciting about back-

But thanks to recent software and hardware advances, network backup — storing copies of files from every Mac on a network onto one central device — has just become a lot easier. Network-backup software now lets Mac clients use a single Mac as a backup server, or storage depot. And the best news is that the software automates the backup process: You can schedule backups for whenever you like — you don't have to be there while the chore is being done.



BY
VERNON KEENAN,
KELLI WISETH,
AND THE
MACUSER LABS
STAFF

PHOTOGRAPHY, FRED STIMSON

Media Overview

To back up all the files scattered throughout a network of Macs, you need a lot of storage capacity. And that's just what you get with DAT - digital audiotape - a recent transplant from the high-end-audio world. DAT drives make network backup easy to manage because they provide high storage capacity (1.3 gigabytes) in a small (less than 2 x 3 x .25 inches) cassette at a fairly inexpensive price: At less than \$25 a cassette, DAT storage costs less than 2 cents per megabyte. And with compression available with Retrospect Remote. QTBackup, and Nightshift - that 1.3 gigabytes rises to 2.6 gigabytes today and is expected to increase to 5 gigabytes in the

The only media that approach the capacity

of DAT are erasable optical discs and 8-millimeter tape, neither of which can match DAT's capacity:price ratio. For example, erasable optical discs can hold up to 1 gigabyte of data, but \$200 per disc cartridge is a little steep for a backup budget — and the random-access capability of optical storage is a backup luxury, not a necessity. An 8-millimeter tape cassette can hold as much as 2.2 gigabytes of data but costs about \$60.

As a point of comparison, floppy disks weigh in at about 70 cents per megabyte. And swapping the 800+ floppies it'll take you to back up a 1-gigabyte file server will wear out your floppy drive as well as your elbow.

- Stephen Satchell

Because all the Macs on a network - including AppleShare file servers - are backed up onto one Mac's storage device, that device must be able to hold lots of data. Enter the DAT (digital audiotape) drive, a recent transplant from the audio-equipment world, which is now being bundled with network-backup software. A 120minute DAT cassette can store vast amounts of data — up to 1.3 gigabytes (1,300 megabytes). Some networkbackup software also offers a compression option that can cram 2.6 gigabytes onto the same DAT cassette. As new compression schemes are developed and tape length increases, the amount of data that can be stored on a DAT cassette will continue to rise.

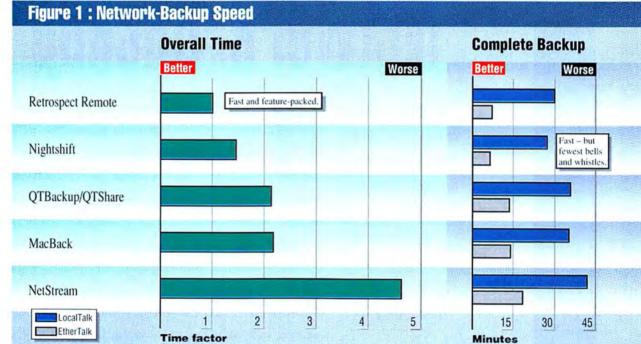


Figure 1: Even though network-backup software frees you from babysitting the process, speed still matters: If you have 15 or 20 Macs to back up during the night, you'll want to make sure that the backup process has finished when you return in the morning. And if you need to restore your entire file server, you won't want to wait all day.

Overall Time:

Our test platform consisted of a client, a backup server, and an AppleShare server on both an EtherTalk network and a LocalTalk network. We normalized the results of all tests on both networks to find the fastest. Retrospect Remote and Nightshift were the overall winners, but Retrospect is more powerful than Nightshift.

Note that PCPC should now be shipping a completely revamped version of NetStream that promises to have much better performance than the version we used for these tests.

Complete Backup:

We timed how long it took to back up 30 megabytes of test files from the client Mac to the backup server. If you need to back up 20 Macs on EtherTalk with 30 megabytes of data each, NetStream will take about 6 hours — Nightshift can do the same job while you're at a long lunch. If those same 20 Macs are on LocalTalk, NetStream will take more than 14 hours to finish the backup; Nightshift will take only 9 hours.

But if you're backing up 20 Macs equipped with 105-megabyte hard drives, even 2.6 gigabytes will fill quickly if you back up all their files (do a complete backup) all the time. Fortunately, backup software lets you save media — and time — by making incremental backups of your files -that is, backing up only new or changed files once you have a complete backup on tape. Gone are the days - or nights of feeding fresh floppies or other media into a hungry drive (see the "Media Overview" sidebar).

However capacious, a DAT drive is useless without backup software. To help you choose the right backup software for your network, MacUser Labs tested five network-backup applications bundled with DAT drives. We

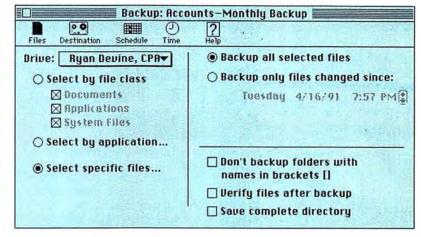


Figure 2: When backing up over the network with the MacBack Client application, users have complete control over file selection and backup scheduling - although the MacBack Server application must also be running on the backup server. Fortunately, MacBack runs under MultiFinder, so the MacBack Server application can always be running in the background.



Incremental Backup:

After editing a series of files, we performed a series of incremental backups - setting the backup software to back up just those files that had changed. Incremental backups can be added to a DAT cassette only after a complete backup — only then can the software know which files have been changed.

Complete Restore:

Restoring an entire hard disk is easy with Retrospect Remote and NetStream - both keep track of file versions for the complete backup and all subsequent incremental backups on the tape. With QTShare and MacBack, you must first restore the complete backup and then

repeat the process by manually selecting the files from incremental backups - in our case, three separate versions. It's up to you to restore the incremental backups in the right order - if you don't, you'll overwrite a newer version of a file with an older version.

Incremental Restore:

We timed how long it took to restore a file from an incrementalbackup session. Finding a single file on a tape taxes the software's cataloging and indexing capabilities. Note that NetStream and Nightshift can't restore directly to a client Mac across the network. To test these two packages, we restored to an AppleShare server mounted on the backup server's desktop.

Network-Backup Software

Four Backup Rules

Using unattended network-backup software is fast and easy, but without systematically applied procedures, it's hardly foolproof. We recommend that you abide by the following four basic rules, regardless of which network-backup package you pick:



Establish a regular backup routine. Inform all network users of their respective role in the process

 and stick to the schedule. This rule sounds simple, but it's often overlooked.
 Only regular, frequent backups will give your network the protection it needs.



Establish a generational backup system. Backing up onto a series of alternating tapes has long been part

of backup systems in the mainframe and minicomputer world. The generational backup system, also called the grandparent/parent/child rotation scheme, is one such plan that is easy to follow and ensures that three versions of your data safely live on tape. Here's how it works: Say you decide you want a weekly full backup of your ten-Mac network. At the end of week 1, make a complete backup, using a fresh new DAT cassette; label the cassette; and place it in the proverbial clean, dry place - preferably a cement-lined or otherwise fireproof file drawer. At the end of week 2, make another complete backup, also using a clean fresh DAT cassette. And likewise for week 3. These three tapes represent three generations of your network's data and can be thought of as grandparent, parent, and child.

At the end of week 4, get out the oldest backup DAT cassette — the grandparent — and use that tape for your backup. Do the same each succeeding week, taking the oldest backup cassette and using it for the

current week. Perform more-frequent incremental backups in a similar fashion.



Store a second copy off-site. Plan for potential catastrophic physical disasters. Think Biblical: fire, flood,

earthquake. Taking a second copy of your backups off-site is added protection. If you must keep the second copy on-site, be sure to keep it in a locked, cement-lined file drawer or yault for safekeeping.

And speaking of Biblical catastrophes, let's not forget the plague — your data's mortality rate can rise quickly when under siege from a computer virus. Keep an eye out for symptoms of infection, and have a copy of Disinfectant at the ready.

Incidentally, Retrospect Remote lets you automatically make that second copy at the same time you make the first, so there's really no reason for not doing so if you're using that software.



Archive dormant files. Make a list of files that are at the core of your business or that you need to keep

track of for audit purposes. For example, say you are a tax accountant with monthly clients and annual tax clients. When tax season is over, you can archive the annual client data — that is, back up just the files relating to annual clients and remove those files from your hard disks and file servers. Such archives should be well labeled and cross-referenced to a paper index. When the IRS comes calling, you'll be able to find all 1989 supporting schedules for Ralph's PC Consulting Business, restore the files, and confidently face the auditor — although your client may try to hide in your cement-lined file drawer.

- Kelli Wiseth

looked at ADIC's MacBack 2.0, PCPC's NetStream 2.0.4, TTI's Nightshift 1.5, Tecmar's QTBackup with QTShare 1.0, and Dantz's Retrospect Remote 1.2. Except for Retrospect Remote, these network-backup applications were designed by DAT-drive vendors to work with their hardware. Prices, including the drives,

range from \$2,995 to \$5,393. Retrospect Remote (\$449 for ten clients) is software that works with a variety of storage media and is bundled with hardware from several vendors. Dantz recommended EMAC's Metro DAT/Retrospect Remote bundle for our tests, because the Metro DAT is representative of many DAT drives sold without

vendor-developed backup software.

To test network-backup speed, we created a three-Mac network - a client, a backup server, and an Apple-Share file server — in the MacUser NetWorkShop, Our client Mac contained 30 megabytes of files tucked into folders, to represent a typical Mac hard-disk drive. We timed a complete backup and then modified a series of three files, performing an incremental backup in each instance. We also timed how long each package took to restore a single file and to restore the complete backup. Speed differences among the software packages point out, among otherthings, how well - or how poorly -the software's catalog system works (how well the software keeps track of all the files on the tape).

But speed isn't the only factor to consider when you choose software. We also evaluated how easy each application is to install and use; odds are pretty good that if it's a pain to use the software, the backup chore won't get done. And we looked at advanced features such as password protection, scripting capabilities, and other tools that help manage network data. Retrospect Remote, for example, lets you archive files — define and remove dormant, or inactive, files from the source in a single step after backing up to tape for permanent storage (see the "Four Backup Rules" sidebar).

Quick and Easy Setup

Any Mac on your network, except for an AppleShare server, can provide backup service for your network. Typically, network administrators assume the role of backup administrator and use their own Mac as the backup server. Simply plug the DAT drive into the Mac's SCSI port, and drag the backup-server software onto the hard disk. Next, install the client version of the backup software onto each Mac on the network you want to back up.

Client software usually consists only of the ADSP (Apple Data Stream Protocol) INIT and other INITs or control panels (see the "ADSP and System

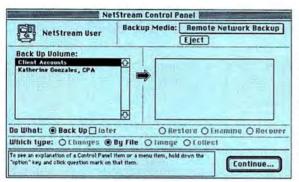


Figure 3a: Backing up with NetStream takes planning. Users select files for backup, using the NetStream User application to create Remote Backup Sets; the backup administrator schedules the backup time, using the NetStream Admin application on the backup-server Mac.

Back Up "Katherine Gonzales, CPA" File/Folde Last Modified / Folder Inf. 29 files/9 folders Apps
Client Accounts 10 files/14 folders 2 files/2 folders 3 files/3 folders Corporate
Hon-profit Accounts ☐ Homefront Environment
☐ La Escuela de Noche
☐ Ms. Vizard's Toystore
☐ Partnerships
☐ Sole Proprietors 72K 1 file 1 file 3 files/3 folders 2 files/2 folders Fri, Apr 12, 1991 2:34 PM Desktop
FrameMaker 5315K 133 files/25 folders 3 files selected (216K) 2 SS, 1 DS or 1 HD disks req For an explanation of an item, hold down the option key and chos Cancel OK Figure 3b: NetStream users have a great deal of control over file selection, but because the backup administrator schedules backups, users can't back up on the spot. Both client and backup-server Mac must be left in the Finder for the backup applications to work.

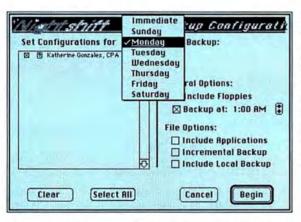


Figure 4: Nightshift is an especially straightforward and easy-to-use network-backup package. You can select the volumes you want to back up, select the type of files you want to back up, and schedule the backup — all in one dialog box.

7.0" sidebar). These two distinct software components — the client software and the backup-server software — work together to create a connection between the two that ensures reliable data transfer. Through this connection, the contents of the client hard disk "stream" to the backup server — and hence to the DAT drive connected to the backup-server Mac.

But that data won't stream anywhere if you don't finish setting up the software. For example, the MacBack backup administrator uses the MacBack Server application to enter the Chooser names of all users so they can access the backup server. With NetStream, not only must the administrator name the backup server but all users must also name their machines—a step that could have been avoided had PCPC chosen to use each Mac's Chooser name for identification.

On the other hand, setting up Nightshift is a snap. Simply copy ADSP and Nightshift Client into each client's System Folder, and reboot. Installing QTShare is also simple — you just copy the QTShare INIT/control panel, along with ADSP, into the System Folder of each client Mac and the backup-server Mac. In addition, the backup-server Mac needs a copy of the OTBackup application.

Retrospect Remote's installation is a bit more time-consuming, because of copy protection: After copying the Remote INIT and ADSP to each client Mac's System Folder, the backup administrator must enter a code (from the Remote Activator Code List, which comes with Retrospect Remote) on the backup server for each client Mac. The backup administrator can also enter a password for each user.

With the software installed, nodes named, activator codes entered, and passwords established, you're ready to back up some networked Macs.

Freedom of Choice

Although these network-backup applications all rely on a central Mac as backup server — and a person, the backup administrator, to manage the

ADSP and System 7.0

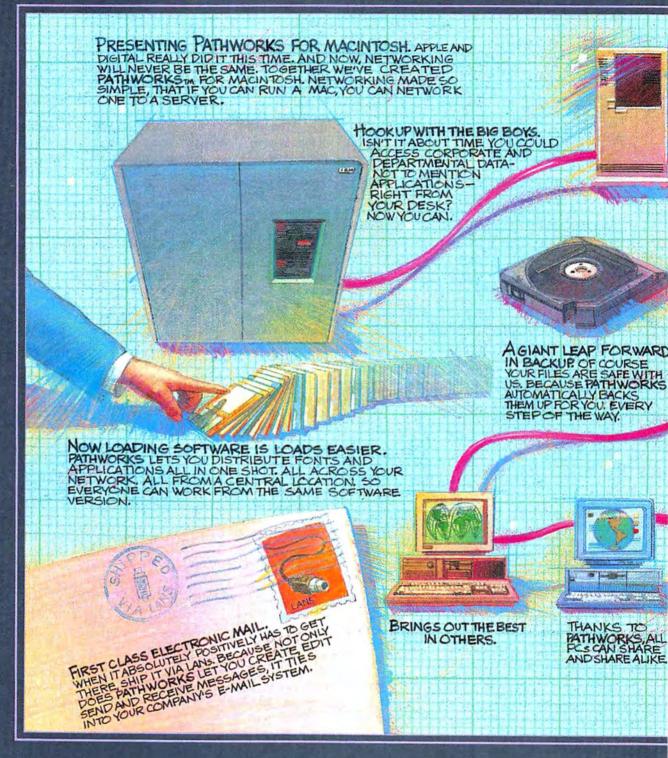
Part of the setup process for most of the network-backup products we tested includes copying ADSP (AppleTalk Data Stream Protocol) into the System Folder of the backup-server and client Macs. Why?

ADSP is the newest member of the AppleTalk family of network protocols from Apple. It provides a standard method for transferring large volumes of information over an AppleTalk network by creating an "information pipe" between two Macs. This pipe ensures more-reliable data delivery — so it's natural that most network-backup software uses ADSP to send data between a client and a backup-server Mac.

ADSP is now built in to System 7.0, but in the old days — such as when we tested the network-backup software for this report — the ADSP INIT had to be dropped into System Folders of all Macs. Only NetStream doesn't use ADSP for network communication, but that's about to change too.

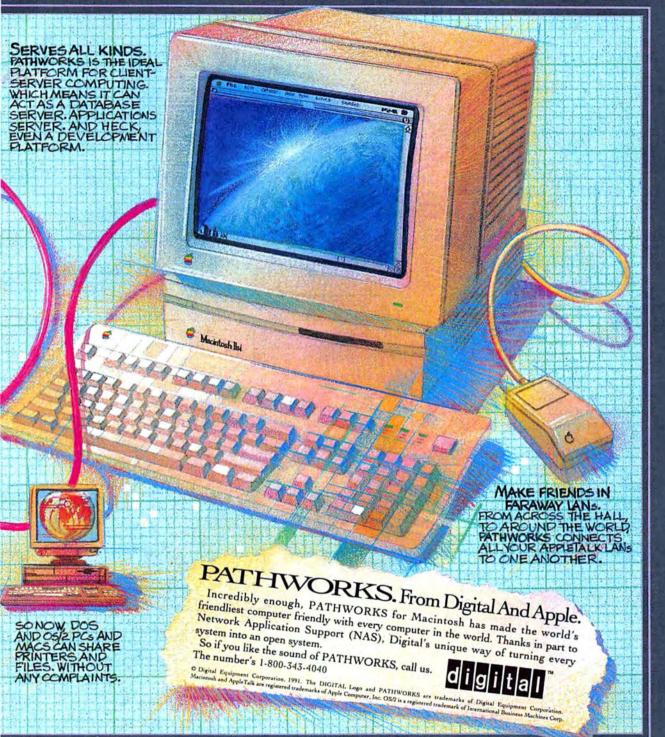
Stephan Somogyi

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Network-Backup Software

process — the amount of participation required by users and backup administrator at backup time varies among the applications (see the "How It Works: Network Backup" sidebar).

If you're a network administrator responsible for the integrity of network data—and possibly maintaining an electronic audit trail — you should choose backup software that gives you maximum control over the backup, archiving, and retrieval of that data. On the other hand, if users are responsible for their own backup, a client-directed approach may work better.

MacBack, for example, leaves the bulk of backup tasks to network clients (see Figure 2). Users log on to the backup server, select files, and schedule a backup time. Unfortunately, such a scheme is inconvenient to use during business hours — if a user wants to back up a 5- or 10-megabyte 24-bitcolor graphics file before going to lunch, the backup administrator must launch the application on the backupserver Mac before backup can occur. Although the backup administrator can schedule a backup for a particular user, that client Mac won't find out until its user logs on to the server. And on top of the inconvenience of tying up both Macs — and both user and administrator - MacBack doesn't let you get back to your regular work very quickly. Even over EtherTalk, MacBack took almost 14 minutes to back up our 30megabyte test folder (see Figure 1).

Backup with NetStream is a 50-50 proposition, with users and backup administrator alike having specific roles in the backup process. NetStream clients create an RBS (Remote Backup Set)—a list of the files and volumes to be backed up—and the backup administrator creates a schedule for scooping up these RBSs over the network (see Figure 3).

Unfortunately, there's no way to back up immediately: Both backup-server Mac and client Mac must not be running any application — including their respective NetStream applications — for backup to occur. When the scheduled time arrives, both client and

How It Works: Network Backup

Network-backup software lets you use one Mac on your network as a backup server for backing up all the Macs on your network — including your AppleShare server. The backup server is simply a Mac with a high-capacity storage device — such as one of the DAT drives we used in our testing for this report — connected to it and with the server version of the backup software installed

Clients on the network use INITs that control the backup process; some products also provide applications. The relationship between client and backup-server Mac varies among packages: In some cases, users must launch a client application and select files for backup; in others, the backup administrator launches the backup-server application and does all the work.

MacBack





EtherTalk or LocalTalk



MacBack Client

User launches the MacBack Client application.



Logs on to the MacBack backup server.



Selects files to back up.

Schedules time to back up.



MacBack Backup Server

Backup administrator launches MacBack Server application.

NetStream





EtherTalk or LocalTalk

NetStream Client

User launches NetStream User application.



Creates a Remote Backup Set (a list of files to back up).



Quits the application, leaving the Mac in the Finder so that the backup can occur.



NetStream Backup Server

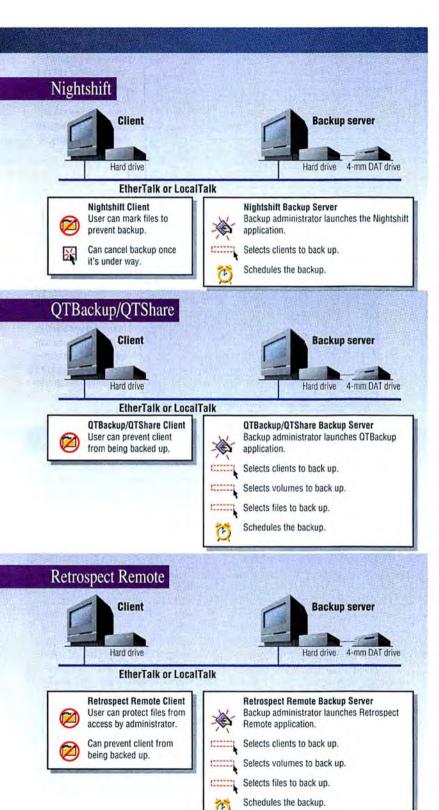
Backup administrator launches the NetStream Admin application.



Creates a Remote Backup Schedule (a list of sets to back up and when).



Quits the application, leaving the Mac in the Finder before backup can occur.



backup server must be in the Finder; only then do the User and Administrator versions of the software automatically launch. The backup then runs its course, and both applications automatically quit. NetStream was clearly designed to be used overnight — set everything up, and then walk away.

Such a scheme might sound OK in theory, but you need a lot more flexibility in an active network environment than you get with the current version of NetStream - you may want to back up on the spot, for example, rather than at some time in the future. In addition, the documentation and the interface are confusing and there are many ways to stray in the program and do things wrong - and the software doesn't prompt or otherwise warn you. For example, we created an RBS on our client but had neglected to name that Mac during the NetStream setup. NetStream doesn't use the Chooser name, so when we tried to schedule backup of that RBS, our backup server couldn't find our nameless client alas, our RBS was for nought. And not only was NetStream the most difficult to set up and use but it was also the slowest overall-even over Ether Talk, backing up 30 megabytes' worth of files took close to 20 minutes.

By the time you read this, however, PCPC will be shipping a completely revamped version of NetStream that should be faster, have more features, and sport an improved interface (see the "On the Horizon" sidebar).

Backing up with Nightshift is an exceptionally simple affair, initiated and controlled only by the backup administrator. The Nightshift application searches the network for all Nightshift client Macs and displays a scrollable list from which to select volumes to back up (see Figure 4).

But there's a price for such simplicity: Nightshift is the most limited of the five programs we tested. You can choose between a complete backup and an incremental backup, and although you can choose to exclude applications from the backup, you can't selectively back up a particular file

Network-Backup Software

type, such as all Excel worksheets or all TIFF files, as you can with Retrospect Remote and QTBackup.

On the other hand, Nightshift is a speed demon — it took a little more than 6 minutes to completely back up 30 megabytes — less than half the time of NetStream, MacBack, and QTBackup.

QTShare and Retrospect Remote also place the burden of network backup on the backup administrator. A QTShare backup session is executed from the backup server; QTBackup lets you create a script that specifies which client volumes and files you want to back up. The scripting process simply records your selections to a file you can name and modify: You don't need to know any scripting language.

QTBackup's appropriately named PowerTag feature (see Figure 5) lets you make sophisticated file selections — such as backing up all files created by Excel after January 1, 1990. You can also schedule scripts to run at a specific date and time. At the scheduled time, the QTBackup application automatically launches on the backupserver Mac and executes the script; the client doesn't have to do anything.

Retrospect Remote (see Figure 6) also has many sophisticated file-selection and scripting features. As you select the drives and files to back up, Retrospect Remote saves your steps in a default script called Backup. The next time you begin a backup session, your settings will already be selected although you can modify them if you wish. Retrospect Remote also lets you create and name other scripts, so you can build a library of sophisticated backup procedures. You can use Retrospect Remote's Calendar feature to completely automate backup. As long as the client Mac and backup-server Mac are on, the Auto Launch feature will start Retrospect Remote and perform the backup.

Find — and Restore — Files Fast

Once you've gotten your files selected and calendars or scripts established, your backup process becomes

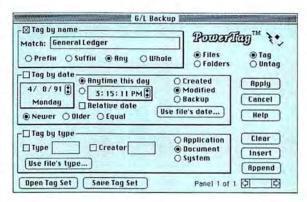


Figure 5: QTBackup's PowerTag feature gives you a host of file-selection options, including selecting for a particular text string. Each Tag Set can be saved and scheduled to occur regularly, if desired.



Figure 6: Retrospect
Remote gives the
network-backup
administrator
complete control over
file selection. All your
selections are stored
in the default Backup
script, which you can
edit, copy, rename —
or simply use again by
choosing Backup from
the Action menu.

On the Horizon

As we wrapped up our testing, Apple pulled the wraps off System 7.0. And following quickly on the heels of this release came upgrades to most of the packages we'd tested.

Dantz began shipping a System 7.0-compatible version of Retrospect Remote in April. All registered Retrospect Remote users can upgrade to version 1.3 for free. And with an eye toward the future, when compression will enable even more data to be jammed onto tape, Dantz has increased the upper limit of an archive — a cataloged series of backup sessions — from 2 gigabytes to a whopping 1 terabyte — 1,000 gigabytes (although the hardware to support such capacity doesn't exist). Dantz Development Corp., 1400 Shattuck Avenue, Suite 1, Berkeley, CA 94709; (415) 849-0293.

PCPC NetStream has been around for quite a while, and it's beginning to show its age, as we discovered in our tests. However, PCPC will soon ship a completely new, System 7.0-compatible version of Net-Stream, featuring a revamped interface and implementation of ADSP. PCPC bundles

NetStream with many of its drives. You can buy the software alone (ten-client version) for \$499; site licenses are also available. PCPC, 4710 Eisenhower Blvd., Building A-4, Tampa, FL 33634; (813) 884-3092.

Tecmar should also be shipping System 7.0-compatible versions — QTBackup 3.0 (\$149) and QTShare 1.1 (\$249/unlimited users) — by the time you read this. QTShare is an INIT/control panel that lets QTBackup work with clients over a network. Tecmar's software is compatible with its complete line of tape and optical drives. QTBackup also supports backup of Novell NetWare 2.15 (and later) file servers and maintains the file-server security features. Tecmar, 6225 Cochran Road, Solon, OH 44139; (216) 349-0600.

TTI Nightshift will soon be sold separately (\$495/unlimited users). Nightshift works with TTI's complete line of 4-millimeter and 8-millimeter tape drives; this unbundling will let drives from other vendors take advantage of its speed. TTI, 5401 E. LaPalma Avenue, Anaheim, CA 92807; (714) 693-7707

- Darryl Chan

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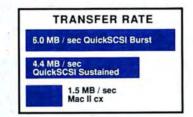
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Table 1 Criteria

Software (list/street) — The list price is the manufacturer's suggested retail price. The street price is an average actual price charged by dealers around the U.S. in April 1991.

Software/hardware bundle (list/street) — The list price is the suggested retail price for the package, including software, as bundled by the hardware vendor. The street price is

an average actual price charged by dealers around the U.S. in April 1991.

DAT drive tested — The model of DAT drive

bundled with the software.

Other devices supported — Other kinds of storage hardware with which the software can be used.

Client application — The name of the software application or INIT installed on the client Mac.

Backup-server application — The name and version number of the application we tested. Network transport INIT — What INIT does the application rely on for assured data delivery?

Archive — Does the software have an option for removing files from the source after backing up for permanent storage?

Auto-launch — Can the application launch on its own when a backup is scheduled to occur?

Auto-shutdown — Can the backup application shut down on its own when the backup has been completed?

Back up client floppies — Can diskettes and other volumes mounted on the client desktop be backed up?

Client cancel backup — Can the client cancel the backup?

Client-controlled scheduling — Can the client set the backup schedule?
Client-excludable files — Can clients place

a special character in front of filenames to prevent backup of certain files?

Client password — Is access to a client's backup files password-protected?

Client-selectable files — Can the client select files for backup?

Cumulative-logfile — Is all backup history stored in one convenient log file?

Daily-log file — Is backup history stored as a series of daily files?

Encrypted backup — Does the backup have password protection?

File compression — Does the software provide file compression, which can double the storage capacity from 1.3 gigabytes to 2.6 gigabytes per DAT cassette?

Network data encryption — Is data encoded as it travels across a network?

Restore to AppleShare volume — Can files be restored to the AppleShare file server?
Restore to client over network — Can files be restored directly to the client Mac from which they originated?

Scheduled backups — Does the software let you schedule backups for unattended times in the future?

Scripting — Can you create automated routines for various kinds of backups?

Server password — Is access to the backup-server application password-protected?

Write-verify — Does the backup-server application confirm that data has been correctly written to the tape?

pretty routine. The excitement begins when you need to restore.

The dreaded moment has arrived: You need to recover a single file or the contents of an entire hard disk because of mechanical failure, virus, or other calamity. Are you going to have a stroke—or a stroke of luck? MacBack, Retrospect Remote, and QTBackup provide the most immediate relief to a panicky client, because they let you pick and choose files from the backup server and bring them right back to a client hard disk over the network. NetStream and Nightshift, on the other hand, can restore only locally—to the Mac that has the DAT connected to it.

Restoring files with MacBack can

be a hassle, because it requires some coordination between the backup administrator and the client. Both Macs need to be running their respective applications, but the client retrieves the files from the tape loaded at the backup server. Such a scheme is good for workgroups in which users are responsible for their own files. However, you also need some time: MacBack was the slowest overall in both our complete- and incremental-restore tests.

Unfortunately, you can't restore files to a client Mac over the network with either NetStream or Nightshift. Both applications can, however, restore to a volume — such as an AppleShare file server — mounted on the backup server's desktop. You then have to copy the files from the AppleShare server to the client — all in all, not the slickest implementation.

Despite this limitation, Nightshift was the fastest in the incremental-restore tests, taking about 30 seconds to restore a 1-megabyte file. Nightshift was able to completely restore all 30 megabytes of our test files in a little more than 11 minutes. If network users back up their files each day to an AppleShare file server, then you may not even need to back up — or restore — to clients at all, and Nightshift's inability to do either may not be a problem.

Restoring files with QTBackup across a network requires coordination between client and backup administrator. Unlike with MacBack, which lets the client select the files to retrieve, the backup administrator uses QTBackup at the backup server to select files and send them back across the network to a QTShare client. This scheme works well for backup administrators who have complete control over a workgroup's data.

Likewise, Retrospect Remote can put files back onto a client's hard disk across the network quickly and easily. Retrospect Remote's sophisticated cataloging system keeps track of all versions of all files you've backed up. When you specify a file to restore by name, Retrospect Remote prompts you with the name of the DAT cassette that holds the most recent version of that file.

AppleShare-Server Backup

Backing up AppleShare file servers poses special problems, because of the security measures built in to the AppleShare file-server system. AppleShare users must be *registered* on the server, given a password, and placed in one or more user groups; to access the file server, users log on to the server with their user name and password. AppleShare keeps track of this information in a password-protected Users & Groups file, and the



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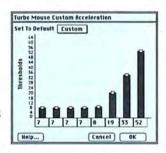
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Network-Backup Software

network administrator is usually the primary person with access to this file. While the AppleShare-server application is running, the Users & Groups file is open — to properly control access to the AppleShare server — so it can't be backed up.

In addition, each folder on an AppleShare server has an owner who controls access privileges — conditions for whether or not users can read or modify any contents of the folder. Any backup copy of your AppleShare server's data must maintain these privileges. For example, you'll want the personnel department's Salaries folder to keep its access privileges — and hence, its security — intact if you ever need to restore it from a backed-up copy.

The manuals of all the applications we tested discuss these issues in depth and offer several alternatives to AppleShare-server backup — some more cumbersome than others. One method all the applications share — the easiest one — is simply to mount

the AppleShare-server volume on the backup-server Mac's desktop and back it up as a local volume. Folder privileges remain intact, but the Users & Groups file is not copied. As long as the network administrator has a copy of the Users & Groups file safely stored on diskette—and any network administrators worth their salt certainly should have made such a copy, using the AppleShare Administrator application — the AppleShare server can be rebuilt with about the same amount of ease with any of these applications: Reinitialize the AppleShare hard disk, run through the AppleShare installation process, and launch the AppleShare Administration program. When you're prompted for Users & Groups, pull your backup diskette out of your file drawer.

Simple Solutions, Simple Choices

Backing up a hard disk full of data is a chore that not many of us get around to often enough — but that every one of us wishes we had done when it's our turn to suffer the inevitable crash. A new crop of network-backup solutions — software that's bundled with high-capacity DAT drives — can now shift the burden of backup responsibility to that most overworked and underappreciated being, the network administrator. Some of the products also let clients perform their own backups — and let them restore files when needed.

But if backing up over your network isn't any easier than physically lugging a DAT drive from Mac to Mac, it won't be done. Restoring files should also be quick and easy, and users shouldn't have to search through a series of DAT cassettes to find the latest version of the files they need. Finally, speed is important, but it's not the overriding factor in the choice of a package.

Vernon Keenan is a Macintosh networking consultant and educator. Kelli Wiseth is a MacUser associate editor whose late-night backup sessions have never, alas, involved singing behind Ray Charles.

The Bottom Line

Network-backup software automates the monumental task of backing up all the Macs on a network. It should be easy to use and fast, and retrieving important files should be just a few mouse clicks away. If you're looking for a fast backup system that can help you effectively manage the backup process, we recommend **Retrospect Remote 1.2** (\$449/ten clients), from Dantz. It provides many powerful file-selection features, supports a wide variety of media — DAT cassettes, diskettes, SyQuest cartridges, WORM discs, hard disks, and tape cassettes—and quickly restores the files you need, over the network. Retrospect Remote has some features that aren't available in other packages, such as the ability to make backups on two different media during the same backup session. It also provides password-protection, encryption, and scripting capabilities.

If you don't need sophisticated file selection, try TTI's **Nightshift** 1.5 (\$495). It's fast, but it doesn't provide as many features as the other packages. It lets you do full or incremental backups and you can select certain file types not to back up, but you can't select just a particular group of files to back up and you can't restore over the network to a client. But Nightshift is a speed demon, and it's exceptionally easy to use — you can digest the entire manual in less than an hour.

Ideally, we'd like to see Nightshift's ease of use combined with Retrospect Remote's powerful feature set. Now that would be worth writing about — maybe in the middle of the night, while you're backing up.



Our top network-backup picks: Dantz's Retrospect Remote 1.2 (right) is a full-featured time-saver, whereas TTI's Nightshift 1.5 (left) is lean and mean.

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● = yes	MacBack 2.0	NetStream 2.0.4	Nightshift 1.5
O=10	111	11	\$\$\$%
Price			
Software (list/street)	NA	\$499 (10 clients)/NA	\$495/NA
Software/hardware bundle (list/street)	\$4,995/\$3,745	\$3,479	\$2,995/NA
Pros	Can restore to clients over	Good file-selection	Second-fastest, Easiest
	the network. Client-controlled	features for restore.	to install and use.
	file selection.		
Cons	Requires both client and	Clumsy interface. Cannot	Limited file selection for
	backup-server applications to	restore directly to clients	backup. No scripting.
	be running. Slow.	over the network.	
Hardware			
DAT drive tested	ADIC MacBack DAT	PCPC DATStream	TTI CTS-4M Plus
Other devices supported	Various tape drives	PCPC JetStream	none
Software			
Client application	MacBack Client 2.0	NetStream User 2.0.4, Timer INIT	Nightshift Client INIT
Backup-server application	MacBack Server 2.0	NetStream Admin 2.0.4	Nightshift 1.5
Network transport INIT	ADSP	Master INIT, User INIT	ADSP
Features			
Archive	0		0
Auto-launch			0
Auto-shutdown		•	•
Back up client floppies		0	•
Client cancel backup		0	•
Client-controlled scheduling		0	0
Client-excludable files	0	0	•
Client password			0
Client-selectable files		•	0
Cumulative-log file		0	0
Daily-log file	0	•	
Encrypted backup	0	0	0
File compression	0	0	•
Network data encryption	0	•	0
Restore to AppleShare volume		•	•
Restore to client over network		0	0
Scheduled backups	•		•
Scripting Server password	•		0
Write-verify		0	0
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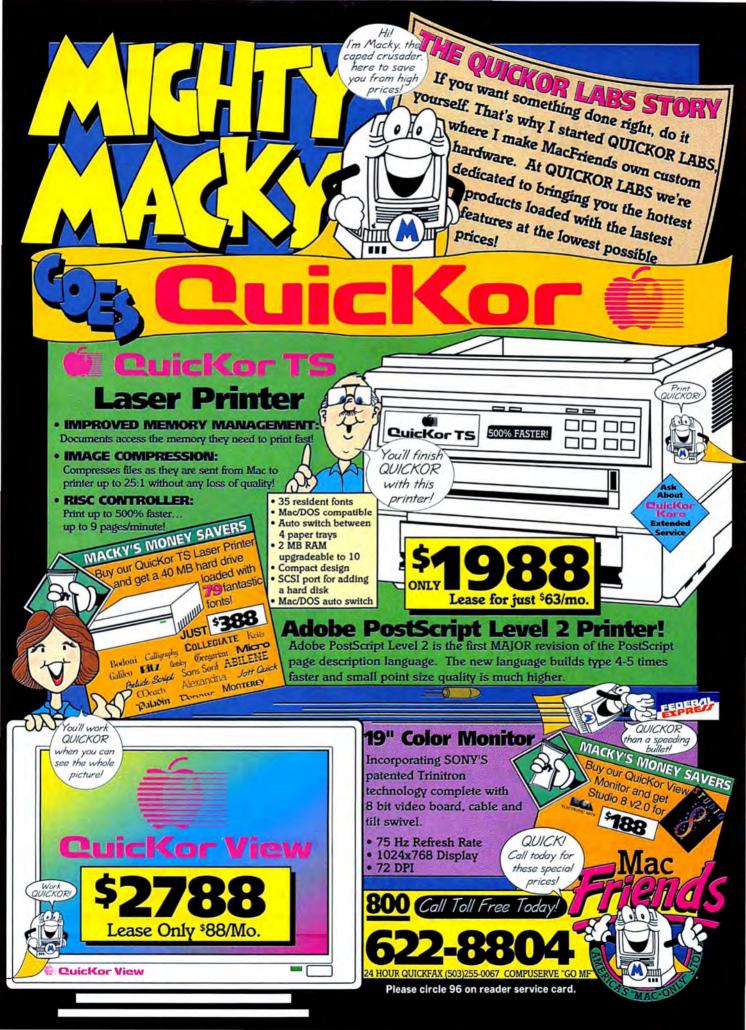
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participating CD-ROM dealer or distributor before January 15, 1992. "Suggested retail price, actual price, actual

Table 1: Features of Network-Backup Software, continued QTBackup with QTShare 1.0 Retrospect Remote 1.2 O = 10 \$\$\$% \$\$\$\$% Price \$449/\$280 (10 clients) Software (list/street) QTShare, \$249/\$195 (10 clients)* \$2,995/\$2,3951 Software/hardware bundle (list/street) \$5,393/\$4,050 Excellent documentation. Powerful Overall fastest. Restores files Pros scripting. Moderately easy to use. quickly to clients over the network. Cons Must register all users. Slow. Doesn't automatically Confusing documentation. restore incremental backups in correct order. Hardware DAT drive tested Tecmar DATaVault EMAC Metro DAT Other devices supported all Tecmar tape drives cartridge, tape, hard drive, WORM Software Client application Remote INIT QTShare 1.0 Backup-server application QTBackup 2.04 Retrospect 1.2 Network transport INIT ADSP ADSP Features Archive 0 Auto-launch 0 Auto-shutdown O Back up client floppies 0 0 Client cancel backup Client-controlled scheduling 0 0 Client-excludable files • 0 Client password Client-selectable files 0 0 Cumulative-log file . Daily-log file 0 0 **Encrypted backup** 0 File compression . Network data encryption 0 Restore to AppleShare volume Restore to client over network Scheduled backups • Scripting • Server password Write-verify . Company Tecmar Dantz Development Corp. 6225 Cochran Rd. 1400 Shattuck Ave., Ste. 1 Solon, OH 44139 Berkeley, CA 94709 (415) 849-0293 (216) 349-0600

^{*}Also requires parent application, QTBackup (\$149/\$116).

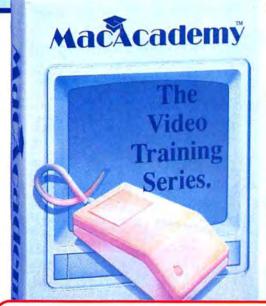
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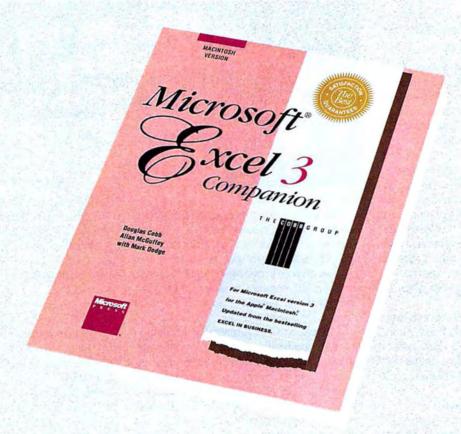
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COMMUNICATIONS

ONNECTIVITY

AlisaTalk ttt

AlisaTalk, a file server for networked Macs, provides numerous features for VAX, DOS, and Mac interoperability. Slow for AFP file sharing and requires knowledge of VMS. Allows any number of simultaneous users. Version 3.3 reviewed. Requires DEC VAX. 10-user license, \$1,500; unlimited-user license, \$4,700. Alisa Systems, 221 E. Walnut St., Ste. 175, Pasadena, CA 91101. (818) 792-9474. (June '91)

DAL (Data Access Language)

DAL is an API (application-programming interface) for sophisticated client/server database access. Server operating systems include IBM MVS and VM as well as VAX/VMS. Databasemanagement systems include DB2, Ingres, Oracle, Rdb/VMS, SQL/DS, Sybase, Informix, and IBM MVS and VM. Offers server independence but is slower than Oracle's SQL*Net or Tech-Gnosis' SequeLink. Version 1.2 shipping. Free with System 7; Client Toolkit, \$695; servers, \$5,000 - \$20,000. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Jan '91)

LapLink Mac III ttt LapLink Mac III is a Mac-to-DOS and Mac-to-Mac file-transfer program that lets you have control from either computer. Version 3.0 has a revised interface. It uses a special cable to provide 750-Kbps transfer. It has an INIT that gives you background access to your remote Mac's files even when LapLink isn't running. You can protect the Mac globally for read/ write or read-only access. Directory sorting-and-searching capabilities are provided along with display filters to show and hide files. Version 3.0 reviewed. \$189.95. Traveling Software, Inc., 18702 N. Creek Pkwy., Bothell, WA 98011. (800) 662-2652 or (206) 483-8088. (Sept '90) MacLinkPlus/PC tttt

MacLinkPlus/PC offers translation capabilities between more PC and Mac applications than does any other such utility. Its interface is friendly, and translations are clean. In addition to translating locally or over a network, the package can connect to a PC serially or by modem. Translators also work with AFE. Version 3.05 reviewed. Version 4.5 shipping. Requires Mac Plus or later and hard-disk drive. MacLinkPlus/PC

(with telecommunications), \$199:

MacLinkPlus/Translators (desktop version only), \$169; Mac-LinkPlus/Wang VS, \$395; Mac-LinkPlus/Wang OIS, \$495. Data-Viz, Inc., 35 Corporate Dr., Trumbull, CT 06611. (203) 268-0030. (Oct '89) ★ '89 Edd

MacTOPS Network Bundle

MacTOPS is file-server software designed to network Macs to other computer platforms. Slow and expensive for large networks but supports communication with DOS compatibles and UNIX machines. Files and subdirectories are accessed transparently as if they are Mac folders. MacTOPS handles file translation between platforms. Print spooling and InBox E-mail software are bundled. Serialized. Supports AppleTalk, FlashTalk, EtherTalk, and TokenTalk. Unlimited number of simultaneous users. Not AFP-compliant, Version 3.0 reviewed. Requires Mac Plus or later and System 6.0.3 or later. \$299 per node; no site license available. Sitka Corp. (formerly TOPS), 950 Marina Village Pkwy., Alameda, CA 94501. (800) 445-8677 or (415) 769-9669. (June '91) ★ '87 Eddy

MacWorkStation tttt MacWorkStation is a develop-ment environment. It is also a communications program that accesses custom mainframe applications through the Mac interface. Modular design allows expansion. Mac II and MultiFinder friendly. Version 3.0 reviewed. Single-use license, \$100; site licenses available. Apple Software Licensing, 20525 Mariani Ave., Cupertino, CA 95014. (408) 974-

4667. (Oct '88)

NetWare for Macintosh tttt NetWare for Macintosh lets Macs on LocalTalk or Ethernet networks connect to a NetWare file server, using AppleShare client software. Difficult PC-based setup and administration. Not recommended for Mac-only networks. It's fast and secure for Mac users with non-AppleTalk PC networks attached to NetWare servers. Maximum simultaneous users: 100. Version 2.0 reviewed. Version 3.0 shipping. Requires 80386based PC for server, Ethernet-capable PC or Mac for administration, and SFT NetWare version 2.15c. Version 2.0 (unlimited users), \$200; version 3.0 (20 users), \$895; version 3.0 (100 users), \$1,995; version 2.15 free with NetWare OS 2.2. Novell, Inc., 122 E. 1700 S., Provo, UT 84606. (800) 526-5463 or (800) 453-1267, (June '91) * '88 Eddy Oracle for Macintosh ###

Oracle for Macintosh is more a MICE RATINGS \$ 1/2 \$ 111/2 \$ 111/2 \$ 111/2 \$ 111/2 \$ 111/2 \$ 111/2 \$ 111/2 \$ 111/2 \$ 11/2 \$ 1

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development tool kit than a user product. It allows creation of powerful front-end Mac applications that can access Oracle databases on mainframes and minis. Has HyperCard XCMDs. Version 1.1 reviewed. Version 1.2 shipping. Requires Mac Plus or later with 2 MB of RAM, System 6.03 or later, and a hard disk with 5 MB of free space. NetWorkStation version requires SequelNet for Macintosh (\$299), Single-user version, \$299; NetWorkStation version, \$299; database version, \$699. Oracle Corp., 500 Oracle Pkwy., Redwood Shores, CA 94065. (800) 345-3267 or (415) 506-7000. (June '89)

PacerShare ttt/2

A file server for networked Macs. PacerShare is the fastest VAX server we tested. Extra functionality comes at a high price. Maximum simultaneous users: 500. Supports Ethernet but not LocalTalk, Requires VAX. 10 users, \$2,100; 20 users, \$3,750. Pacer Software, 7911 Herschel Ave., Ste. 402, La Jolla, CA 92037. (619) 454-0565. (June '91)

Pathworks for Macintosh ### Pathworks, a file server for networked Macs, provides self-installing, extensive VAX connectivity. Slow for AFP file sharing and crashed when 20 clients were connected (in our tests), although the number of simultaneous users is theoretically unlimited. Bundled with Mail for Macintosh, MacTerminal 3.0, and MacX. Supports Ethernet but not Local-Talk. Can't be administered from a Mac. Requires VAX. \$295 per user. Digital Equipment Corp., 146 Main St., Maynard, MA 01754.(508)493-5111.(June 91) pcMACTERM II tttt

pcMACTERM II lets your Mac take control of a DOS machine from the Mac keyboard. Allows DOS files to be printed through the Mac. Version 1.1 reviewed. Version 3.11c shipping. Requires Mac Plus or later with System 6.0.3 or later and printer, IBM PC or later, and DOS 2.0 or later with at least 256K of RAM. \$179 for pcMACTERM II and \$395 for pcMACTERM/Network. Dynamic Microprocessor Associates (DMA), 1776 E. Jericho Turnpike, Huntington, NY 11743. (516) 462-0440. (Jan '89) QuickShare 2.0 \$\$\$%

QuickShare 2.0 (formerly sold by Compatible Systems) connects your Mac to a PC via SCSI, enabling the Mac to access files on a PC or a PC network. File-transfer software provides generic text and graphic translations. Version 2.0 reviewed. Requires DOS 3.0 or later, \$695. SeeColor Corp., 34004 16th Ave. S., Federal Way, WA 98003. (206) 874-9080. (Oct '89) SequeLink ‡‡‡‡

An API (application-programming interface), SequeLink pro-

vides a faster alternative to Apple's DAL but is difficult to use. Server operating systems supported include VAX/VMS and SCOUNIX/ XENIX. Supported databasemanagement systems include Ingres, Oracle, Rdb/VMS, Sybase, and Interbase. Client operating systems supported include the Mac OS, Windows 3.0, and OS/2. Per user, \$695; servers, \$4,995. TechGnosis, Inc., One Park Place, 621 N.W. 53rd St., #340, Boca Raton, FL 33487. (800) 275-7565 or (407) 997-6687. (Jan '91)

SoftPC \$\$\$%

SoftPC puts an IBM PC XT inside your Mac without making you crack the case to add any special coprocessor boards. The emulation of the DOS machine is done entirely in the software. Version 1.3 reviewed. Requires Mac SE (with 68020 accelerator card), SE/ 30, or II series with 2 MB of RAM and a hard-disk drive. \$199. Insignia Solutions, 526 Clyde Ave., Mountain View, CA 94043. (415) 694-7600. (Nov '88)

Software Bridge for the Macintosh \$\$\$1/2

Software Bridge is a collection of file translators for PC-to-Mac file conversion. Used with the AFE program, Software Bridge provides translators for three Mac word-processing formats (Word, WordPerfect, and MacWrite) and more than 20 DOS formats. It has no translation options for graphics and spreadsheet files. Mac version does a good job of converting PC text files while retaining the original formatting. Version 1.0 reviewed, Mac Plus or later. \$129. Systems Compatibility, Inc., 401 N. Wabash, Ste. 600, Chicago, IL 60611. (312) 329-0700. (Mar '91)

SQL*Net for Macintosh tttt/ Easy to use and fast, SQL*Net is an API (application-programming interface) for client/server database access. Server operating sys-tems include IBM MVS and VM as well as VAX/VMS, UNIX, and OS/2. Intended for use with Oracle databases but offers support for DB2, SQL/DS, and RMA via SQL*Connect gateway. SQL*Net handles most networking protocols and client operating systems. Version 1.2 shipping. \$299 per user; Oracle database for Mac, \$699; servers, \$920 - \$13,000. Oracle Corp., 500 Oracle Pkwy., Redwood Shores, CA 94065. (800) 345-3267 or (415) 506-7000. (Jan '91) StarGROUP Server for

Macintosh \$\$\$\% StarGROUP Server, a file server for networked Macs, provides file sharing for Mac, DOS, and UNIX clients. Slow for AFP file sharing and cannot administer from Mac. Maximum number of simultaneous users is 120. Requires 80386-based PC and StarGROUP LAN Manager Server software. 8

users, \$795; unlimited users, \$1,295. AT&T Computer Systems, 100 Southgate Pkwy., Morristown, NJ 07960. (800) 247-1212. (June '91)

SunTOPS ttt

SunTOPS is file-server software designed to network Sun SPARCstations with Macs using MacTOPS and with DOS machines using DosTOPS. Slow and expensive for large networks. Supports Ethernet/EtherTalk but not LocalTalk. Can handle an unlimited number of simultaneous users. Requires Sun SPARC-station. Onfloppy, \$1,295; on tape, \$1,395. Sitka Corp. (formerly TOPS), 950 Marina Village Pkwy., Alameda, CA 94501. (800) 445-8677 or (415) 769-9669. (June '91)

NETWORKING

3Com EtherLink/NB ###%

This NuBus card has average performance. Version 1.1 reviewed. Requires NuBus-capable Mac. \$595. 3Com, 3165 Kifer Rd., Santa Clara, CA 95052, (800) 638-3266 or (408) 562-6400. (Jun '90)

3Com EtherLink/SE tttt

This Ethernet interface has very fast SE client, server, and raw performance. Version 1.0 reviewed. Requires Mac SE, \$595. 3Com, 3165 Kifer Rd., Santa Clara, CA 95052. (800) 638-3266 or (408) 562-6400, (Jun '90)

Adaptec Nodem ttt

This Ethernet interface has poor file-transfer performance but excellent raw performance among SCSI adapters. Easy to use. Requires Mac SE or later. \$495. Adaptec, 691 S. Milpitas Blvd., Milpitas, CA 95035. (408) 945-2518. (Jun '90)

Apple EtherTalk NB Card tttt Pricey, but excellent in filetransfer tests. Has 3Com hardware, Good raw performance, Requires NuBus. \$599. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, (800) 776-2333 or (408) 996-1010. (Jun '90)

AppleShare \$\$\$\$

AppleShare is file-server software from Apple. Fast and easy to configure and administer. Lets network users protect files from other users at the folder level. No support for VAX clients. Maximum number of simultaneous users is 50. Allows setup and administration from Mac, choice of LocalTalk or Ethernet connection, and AppleShare-PC support. Version 2.0 shipping. Requires a dedicated Mac and a hard-disk drive. \$799; AppleShare Print Server 2.0, \$299. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (June

AppleTalk Internet Router

This software router is the fastest we tested. Can create a large internet with EtherTalk and TokenTalk. Doesn't support dialin access, but offers support for AppleTalk Phase 2, mixed Phase 1 and Phase 2, and token-ring networks. Cabling can be thick coaxial, thin coaxial, or twistedpair. Quality of technical support depends heavily on locating a knowledgeable, cooperative, authorized Apple dealer, Version 2.0 reviewed, \$399. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Apr '91)

APT Communications ComTalk \$\$\$

This EtherTalk/LocalTalk router is a speed demon, available in the widest variety of configurations and prices. APT Internet Manager 5.0 software is powerful but difficult to understand. Router code is in upgradable ROM, and the CPU is a Motorola 68000. Can handle as many as six LocalTalk networks but only one EtherTalk network. Offers support for AppleTalk Phase 2 or mixed Phase 1 and Phase 2, \$5,500 (configurations range from \$3,250 to \$12,000). APT Communications, Inc., 9607 Dr. Perry Rd., Ijamsville, MD 21754. (301) 831-1182. (Apr '91)

Asanté MacCon+ SE 30iE

1111/2

This Ethernet device in an SE/30 is a very fast AppleTalk Phase I server. Fast raw performance. Requires Mac SE/30, S379. Asanté Technologies, Inc., 404 Tasman Dr., Sunnyvale, CA 94089. (800) 662-9686 or (408) 752-8388. (Jun '90)

Asanté MacCon+ SE/E ttt This inexpensive Ethernet device provides very good performance as an SE client. Requires Mac SE. \$379. Asanté Technologies, Inc., 404 Tasman Dr., Sunnyvale, CA 94089. (800) 662-9686 or (408) 752-8388. (Jun '90)

Asanté MacCon+ II/E ttt%

This Ethernet board offers good performance and a competitive price. Skimpy manual, not for novices. Requires NuBus-capable Mac. \$379. Asanté Technologies, Inc., 404 Tasman Dr., Sunnyvale, CA 94089. (800) 662-9686 or (408) 752-8388. (Jun '90)

Aspects tttt

Winner of our 1990 Editors' Choice Award for best workgroup product, Aspects is the first real "groupware" product for the Mac. As with multiuser databases, Aspects provides several users with simultaneous access to multiple documents (limited by available RAM). Word-processing, drawing, and painting modes are provided, but there are no database or spreadsheet modes, outliner, or color support. Operates on Local-Talk, Ethernet, or token-ring networks via AppleTalk, or can use 2,400-bps modems. Version 1.0 reviewed. Per user, \$299; 5 users,

\$895; 10 users, \$1,295. Group Technologies, 1408 N. Fillmore St., Ste. 10, Arlington, VA 22201. (703) 528-1555 (June '91) * '90

Cabletron E4000 ttt%

This Ethernet device is a slow AppleTalk Phase I SE client but a fast Phase 2 SE server. Fiber-optics options are available. Requires Mac SE, \$599 to \$949, depending on configuration. Cabletron Systems, 35 Industrial Way, P.O. Box 6257, Rochester, NH03867. (603) 332-9400. (Jun '90)

Cabletron E5000 \$\$\$\$%

This Ethernet device in an SE/30 is a very fast AppleTalk Phase 2 server. Optional fiber-optics transceiver. Requires Mac SE/30. \$699 to \$949, depending on configuration. Cabletron Systems, 35 Industrial Way, P.O. Box 6257, Rochester, NH 03867. (603) 332-9400. (Jun '90) Cabletron E6000 \$\$\$\$

This Ethernet interface offers excellent performance. Hard to switch cable types. Has fiber-optics option. Requires NuBus-capable Mac. \$699 to \$949, depending on configuration. Cabletron Systems, 35 Industrial Way, P.O. Box 6257, Rochester, NH 03867. (603) 332-9400. (Jun '90)

Carbon Copy Mac \$\$\$%

Carbon Copy Mac is a screen-sharing program that lets two users see and use the same screen simultaneously. A user can be either a host or a guest, not both at the same time. Supports network and modem connections in the same package. Capable of file transfer between Macs. Security features limited to setting a single password for all guests. Version 1.0 reviewed. Version 1.0.4 shipping. \$199. Microcom, Inc., P.O. Box 51489, Durham, NC 27717. (919) 490-1277. (Dec '90)

Cayman GatorBox \$\$\$\% This EtherTalk/LocalTalk hardware router is one of the slowest we tested and has no battery backup. Only one LocalTalk port but many gateway features, in-cluding TCP/IP connectivity. Not recommended for basic routing. \$2,795. Cayman Systems, 26 Landsdowne St., Cambridge, MA 02139. (617) 494-1999. (Apr '91)

Cayman GatorCard E/II tttt// This Ethernet interface is very fast. Uses top-notch Racal InterLan hardware. Requires NuBus-capable Mac. \$595. Cayman Systems, 26 Landsdowne St., Cambridge, MA 02139. (617) 494-1999. (Jun '90)

cc:Mail Mac Platform Pack

cc:Mail is an E-mail product. Features include keyboard loading of recipient names, message prioritizing, multiple enclosures, return receipts, reply and forwarding, storage folders, and archiving. Good interface. PC-to-Macintosh VGA-graphics-display

translation. Up to 20 file enclosures. Requires PC for setup, administration, and server-to-server traffic. No DA for messaging. Slow sending messages to multiple recipients. Version 1.2 shipping. \$495; 8 users, \$195 extra; 25 users, \$595 extra. cc:Mail, 2141 Landings Dr., Mountain View, CA 94043. (800) 448-2500 or (415) 961-8800. (July '90)

Compatible Systems Ether+

This had the best SCSI-adapter client performance of the Ethernet options we tested. Must reinstall to switch from AppleTalk Phase I to Phase II. Requires Mac SE or later. \$495. Compatible Systems Corp., P.O. Box 17220, Boulder, CO 80308. (800) 356-0283 or (303) 444-9532. (Jun '90)

Compatible Systems Ether-Route \$355

This hardware EtherTalk/ LocalTalk router is easy to set up and use and offers fast, solid performance. Current software is Ether Route Manager 1.7.0. Router code is in upgradable ROM, and CPU is an 80C188. Can handle no more than two LocalTalk networks and only one EtherTalk network. Offers sup-port for AppleTalk Phase 2 or mixed Phase 1 and Phase 2. Difficult to change cabling-type switch. Lacks TCP/IP support, but an Ether Route/TCP version is also available. Unlimited, free technical support. \$1,495. Compatible Systems Corp., P.O. Box 17220, Boulder, CO 80308. (800) 356-0283 or (303) 444-9532. (Apr

Dayna EtherPrint \$\$\$\$\$ The EtherPrint is not an EtherTalk/ LocalTalk router, but it lets LaserWriters connected on AppleTalk act like Ethernet devices. When you look at the Chooser on your Ethernet-networked Mac, the printer with EtherPrint attached appears as an available device. EtherPrint has

Ethernet and LocalTalk ports. \$499. Dayna Communications, Inc., 50 S. Main St., Salt Lake
City, UT 84144, (801) 531-0600.
(Apr '91) ★ '90 Eddy
Dove FastNet SE ‡‡‡

This Ethernet interface has average performance. Good diagnostics. Requires Mac SE. \$499. Dove Computer Corp., 1200 N. 23rd St., Wilmington, NC 28405. (800) 622-7627 or (919) 763-7918. (Jun '90)

Dove FastNet SE/30 \$\$ 1/2 This Ethernet device is a very slow AppleTalk Phase I SE/30 card. Good diagnostics. Requires Mac SE/30. \$499. Dove Computer Corp., 1200 N. 23rd St., Wilmington, NC 28405. (800) 622-7627 or (919) 763-7918. (Jun

EMAC SpeedLink SE/30 \$\$\$ This Ethernet device has very slow performance as an AppleTalk Phase 2 SE/30 server. Good performance as client. Good diagnostics. Requires Mac SE/30. \$449. EMAC (Everex Systems), 48431 Milmont Dr., Fremont, CA 94538. (800) 821-0806 or (415) 498-1111. (Jun '90)

EMAC Speedlink II ttt

This NuBus card has average performance. Good software. Requires NuBus-capable Mac. \$449. EMAC (Everex Systems), 48431 Milmont Dr., Fremont, CA 94538. (800) 821-0806 or (415) 498-1111. (Jun '90)

Flash \$\$\$\$%

Flash is a DA/INIT combination that transfers files in the background, with or without Multi-Finder, Uses Finder folders to send and receive files. Has chat capability. Also lets you create a group folder, which sends copies of a file to everyone in a group. Setting the many options is unnecessarily complex. Good performance. Version 1.0 reviewed. Version 1.1 shipping, \$199.95 per zone. Beagle Bros., 6215 Ferris Sq., Ste. 100, San Diego, CA 92121. (619) 452-5500. (Sept '90)

InBox Plus \$\$\$\% Runs on top of AppleShare or SitkaTOPS. Servers can include Macs, PCs, Sun workstations, VAXes, and other platforms. Supports AppleShare, NetWare, 3+, LAN Manager, and TOPS. Clients can be Macs or PCs. There are only Memo and Phone message forms. Supports mailboxes, groups, passwords, and storage boxes. Messages sorted by subject, sender, status, and date. Easy, excellent manual. Unlimited file enclosure. Remembers window positions. No custom forms or keyboard loading of recipient names. Version 3.0 reviewed. Requires Mac Plus or later and System 4.2 or later. Up to 50 users, \$995; up to 100 users, \$1,995; up to 250 users, \$5,995. Sitka Corp. (formerly TOPS), 950 Marina Village Pkwy., Alameda, CA 94501. (800) 445-8677 or (415) 769-9669. (July '90) * '86 Eddy

Microsoft Mail \$\$\$\$

This E-mail package offers a mix of functions for Macs and VAXes. Efficient single-instance storage scheme is used for messages and enclosures to multiple addresses. Features include keyboard name entry for messages, customizable forms, image-display and voicemail support, and interapplication communication with Excel and Word. Clean interface. Simple to install, maintain, and use. No searching or sorting of messages. Version 1.0 reviewed. Version 2.0 shipping. Server and Mac workstation each require Mac Plus or later with hard disk, System 6.0.3 or later; PC Workstation requires 512K of RAM, DOS 2.0 or later, AppleTalk. Mail Server, \$395; 1 to 4 users, \$125; 20-user pack, \$1,495; PC Workstation, \$125.

Microsoft Corp., One Microsoft Way, Redmond, WA 98052. (800) 426-9400or(206)882-8080.(July '90) * '87 Eddy

Novell EtherPort SE/30 ttt

This Ethernet networking device delivers average performance. Lacks diagnostic software. Requires Mac SE/30. \$595. Novell, Inc., 122 E. 1700 S., Provo, UT 84606. (800) 526-5463 or (800) 453-1267. (Jun '90)

NuvoLink SC \$\$\$\\\^2\$ Very good SCSI-adapter client performance for an Ethernet interface. Requires Mac Plus or later. \$495. Nuvotech, Inc., 2015 Bridgeway, Sausalito, CA 94965. (800) 468-8683 or (415) 331-7815. (Jun '90)

PhoneNET Connector Series 300 \$\$\$\$\$

PhoneNET is an AppleTalk-compatible network that can be up to 3,000 feet. Unused preinstalled phone cabling can be used for the network. \$59.95 per node; 10-user pack, \$395. Farallon Computing, Inc., 2000 Powell St., Ste. 600, Emeryville, CA 94608. (415) 596-9000. (Dec '86) ★ '87 Eddy

PhoneNET Liaison \$\$\$\$ This software router has a fast, consistent response and is one of the most versatile we tested. Easy installation plus dial-up capabilities. Excellent entry-level router. Can create a large internet with EtherTalk and TokenTalk. Offers support for AppleTalk Phase 2 mixed Phase 1 and Phase 2, and token-ring networks. Cabling can be thick coaxial, thin coaxial, or twisted-pair. Doesn't support TCP/IP and is slower than a hardware router. Technical support is unlimited and free. Version 3.0.1 reviewed. \$395. Farallon Computing, Inc., 2000 Powell St., Ste. 600, Emeryville, CA 94608. (415) 596-9000. (Apr '91) * '88 Eddy

PhoneNET StarController Series 300 \$\$\$\$%

The StarController distributes AppleTalk signals to devices on a network and provides networkmanagement and troubleshooting capabilities. It's very reliable, with excellent documentation and technical support. Requires PhoneNET StarController wiring kit. \$1,295. Farallon Computing, Inc., 2000 Powell St., Ste. 600, Emeryville, CA 94608. (415) 596-9000. (May '90) QuickMail \$\$\$

QuickMail is an electronic-mail package with superior features. Macs and PCs can be used as clients. Inefficient multipleaddressee scheme affects performance in a busy environment. Users can customize forms. Supports voice-mail and real-time conferencing. Has powerful user tools and is highly configurable. Minor bugs. Version 2.2.2 reviewed. Version 2.5 shipping. Requires Mac Plus or later and

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System 6.0.3 or later. \$199.95; 5 users, \$399.95; 10 users, \$599.95; 50 users, \$2,499.95. CE Software, Inc., P.O. Box 65580, West Des Moines, IA 50265. (800) 523-7638 or (515) 224-1995. (July '90)

Racal InterLan MacConnect

Very fast NuBus card, Lacks diagnostic software. Requires Nu-Bus-capable Mac. \$495. Racal InterLan, 155 Swanson Rd., Boxborough, MA 01719. (800) 526-8255 or (508) 263-9929. (Jun '90)

Send Express \$\$\$\$
Send Express is a DA/INIT combination that sends files or Clipboard contents in the background, with or without MultiFinder. Extremely smooth background operation compensates for sluggish performance. User interface is too complex for those who need to transfer files frequently. Version 1.0 reviewed. Version 2.0.1 shipping. Requires Mac Plus or later. 2 users, \$79; 5 users, \$179. Gizmo Technologies, P.O. Box 14177, Fremont, CA 94539. (415) 623-7899. (Sept '90)

Shiva EtherGate \$\$% This hardware EtherTalk/ LocalTalk router offers wide-areanetworking support and dial-in capability, but performance is slow and the Internet Manager 1.6 software is not intuitive. Router code is in nonvolatile RAM, and the CPU is a Motorola 68000. Can handle no more than two LocalTalk networks and only one EtherTalk network. Offers support for AppleTalk Phase 2 or mixed Phase 1 and Phase 2. Lacks TCP/IP support. Unlimited free tech support. \$2,399. Shiva Corp., One Cambridge Center, Cambridge, MA 02142. (800) 458-3550 or (617) 864-8500. (Apr '91)

Shiva FastPath 4 111 This hardware EtherTalk/Local-Talk router is fast, and it's the only router we tested that supports DECnet. Current software is K-Star 8.0.1. Router code is in nonvolatile RAM, and CPU is a Motorola 68000. Can handle no more than one LocalTalk and one EtherTalk network. Offers support for TCP/IP, AppleTalk Phase 2, or mixed Phase 1 and Phase 2, but only one LocalTalk port is provided. Unlimited free technical support. \$2,795. Shiva Corp., One Cambridge Center, Cambridge, MA 02142. (800) 458-3550 or (617) 864-8500. (Apr '91)

Timbuktu \$\$\$\$% Timbuktu is a screen-sharing program for technical support and training. Allows your computer to be both host and guest or to hook up to multiple hosts simultaneously. Provides the security feature of assigning different "classes" of users. Allows file transfer between Macs. A cluttered dialog box is used to establish guest privileges. Supports only network connections; excludes modem connections. Version 3.1 reviewed. \$149. Farallon Computing, Inc., 2000 Powell St., Ste. 600, Emeryville, CA 94608. (415) 596-9000. (Dec '90) ★ '90 Eddy

Tri-Data Systems MaxWay 500E tt%

Although this hardware Ether-Talk/LocalTalk router is fast, it lacks flexibility in configuration and network management and doesn't support wide-area networking or TCP/IP. Current soft-ware is MaxWay 2.7. Router code is in upgradable ROM, and the CPU is a 10-MIPS SPARC chip. Can handle as many as four LocalTalk networks but only one EtherTalk network. Offers support for AppleTalk Phase 2 or mixed Phase 1 and Phase 2. Includes unlimited free technical support. \$5,495. Tri-Data Systems, Inc., 3270 Scott Blvd., Santa Clara, CA 95054. (408) 727-3270. (Apr '91).

TELECOMMUNICATIONS

Accu-Weather Forecaster \$\$\$\$

Accu-Weather Forecaster is a combination communications and meteorological-data-analysis program. Gives access to hourly National Weather Service reports. Simple maps and charts let you view weather data graphically. Telecommunications mode is optimized to reduce connect-time costs. Version 1.05 reviewed. Version 2.1 shipping. Requires Mac Plus or later and a 300-, 1,200-, or 2,400-bps Hayes-compatible modem. \$79.95; Accu-Weather connect fee, \$39.95; educational and commercial connect rates higher. Software Toolworks, 60 Leveroni Ct., Novato, CA 94949. (800) 231-3088 or (415) 883-3000. (Aug '89) CIM (CompuServe Information

Manager) ttt The CIM interface can help novice telecommunications users get the hang of the popular CIS (CompuServe Information Service). This version is excruciatingly slow at text retrieval and file transfer, however. Because any tasks must be done on-line, you'll quickly amass some hefty phone and CompuServe bills. CIM offers no automated search/retrieval routines. If you use CompuServe extensively, try Navigator instead. Version 1.03 reviewed, Mac Plus or later (hard drive recommended). \$39.95 (incl. \$25 usage credit) or \$24.95 (incl. \$10 usage credit) for CIS members; \$3 for Zmac edition. CompuServe Information Service, 5000 Arlington Centre Blvd., Columbus, OH 43220. (800) 848-8199 or (614) 457-8600. (Mar '91)

Fax Line Manager 1111 Fax Line Manager (formerly Phone Line Manager sold by La Cie) lets you connect a phone, a

fax, and a modem to the same phone line. Two- and three-device versions are available. It's intelligent enough to route incoming calls correctly. Outside callers can be given codes to override it, which saves time. No software needed. Two-device version, \$169; three-device ver-sion, \$229. Technology Concepts, Inc., 1159 Triton Dr., Foster City, CA 94404. (415) 349-0900. (Mar

MicroPhone II \$\$\$\$\%

MicroPhone II is the leader among high-end telecommunication programs, with more options and features than its competition. Virtually all protocols and modems are supported, and many features can be heavily customized or automated. Program complexity and a very busy interface can be drawbacks for novices. Version 3.0 reviewed. Requires Mac Plus or later, \$295. Software Ventures, Inc., 2907 Claremont Ave., Berkeley, CA 94705. (415) 644-3232. (June '90) * '86 Eddy

Navigator 1111

Navigator is a custom application that provides an interface and telecommunications links for the popular CIS. Designed primarily as an off-line, task-management program to minimize on-line connection charges, Navigator performs complex message-handling and file-transfer tasks quickly. Now that most of the early bugs have been worked out, the program's main drawbacks are its unusual interface and difficult handling of scrolling text. Version 3.04 reviewed. Mac Plus or later (hard drive recommended). \$99.95, CompuServe Information Service, 5000 Arlington Centre Blvd., Columbus, OH 43220. (800) 848-8199 or (614) 457-8600. (Mar '91)

Remote Access Pack \$\$\%

Timbuktu/Remote Access Pack is a bundle of Farallon communications products for remote communication. The package includes a V.32 9,600-bps modem, a WakeUp cable with Auto Shut-Down software, Timbuktu, and Timbuktu/Remote. You need two Remote Access Packs to communicate. The modem is a V.32 full-duplex unit and is very sensitive to line quality. Because the modem is the weak link, consider buying Timbuktu, Timbuktu/Remote, and the WakeUp cable separately and provide your own modem. Version 2.0.5 reviewed. \$1,295. Farallon Computing, Inc., 2000 Powell St., Ste. 600, Emeryville, CA 94608. (415) 596-9000. (Sept '90) Remote/WakeUp **\$\$\$**\$%

Remote/WakeUp is a slick hardware/software combination that lets you turn an ADB-capable Mac on from any modem and that also shuts down the Mac after a specified period of inactivity. Uses

a special modem cable that plugs into the modem serial port and the Mac's ADB port. Auto ShutDown is an INIT. Version 1.0 reviewed. \$49.95. Farallon Computing, Inc., 2000 Powell St., Ste. 600, Emeryville, CA 94608. (415) 596-9000. (Aug '90)

Smartcom II tttt

Smartcom II balances power and ease of use. It's capable of unattended operation and has a powerful command language. It has the fastest screen updating available, which can work at 9,600 bps. The large-screen buffer can easily be archived. Version 3.0 reviewed. Version 3.2 shipping. Requires Mac 512K or later. \$149. Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348. (404) 441-1617. (Jan '89) * '85 Eddy

VersaTerm-PRO tttt/2 The VersaTerm-PRO is the first telecommunications package that uses the Apple Communications

Toolbox's add-on modules. Its performance is excellent. It includes a serial module and supports Xmodem, Ymodem, and Kermit transfers. It doesn't have an extensive command or scripting language. Version 4.0 reviewed. \$295. Synergy Software, 2457 Perkiomen Ave., Reading, PA 19606. (800) 876-8376 or (215) 779-0522. (Sept '90)

White Knight \$\$\$\$\% White Knight is the new name for Red Ryder (1987 Eddy winner). Although this completely rewritten telecommunications program is now more powerful, the interface has taken a step backward. The manual is new and much improved. Software extensions called RCMDs (similar to HyperCard XCMDs) are now supported. Contains a lot for a low price. Version 11.02 reviewed. Version 11.10 shipping. Requires Mac Plus or later. \$139. FreeSoft Co., 150 Hickory Dr., Beaver Falls, PA 15010. (412) 846-2700.

(May '90) * '87 Eddy ZTerm tttt

ZTerm is a good, cheap telecommunications program. Rich in features. Interface is intuitive. Xmodem, Ymodem, and Zmodem transfers are possible. Has simple macro ability, capture buffer, keyboard buffering, and dial set-ups. Excellent performance. Easy to use if you have some telecommunications experience. Version 0.85 reviewed. Requires Mac Plus or later, a modem, and cables. Shareware; downloaded, \$30; ondisk, \$40. Dave Alverson, 5635 Cross Creek Ct., Mason, OH 45040. (Sept '90)



DATABASES

4D Calc ttt/2

4D Calc is a spreadsheet module that works with the 4th Dimension database application. Although 4D

Calc can't replace a full-featured spreadsheet program, its "hot" links to 4D databases immediately update shared information. The ability to exchange data as SYLK files between Excel and 4D is adequate, but formulas may be replaced by values (ACIUS' documentation and sample databases are helpful here). 4D Calc offers considerable design potential for 4D programmers contemplating more-sophisticated uses of this module. Version 1.0 reviewed. Requires 4th Dimension 2.1.1 or later. \$295. ACIUS, 10351 Bubb Rd., Cupertino, CA 95014. (408) 252-4444. (June '91)

4D Compiler tttt/2 This developer tool lets 4th Dimension speed up many userdefined procedures, rather than interpreting code into machine language. The program is copyprotected, asking for an original disk at launch and occasionally thereafter. Despite this nuisance, 4D Compiler is indispensable for serious 4D developers. Version 1.0 reviewed. \$1,000; for registered 4D developers, \$700. ACIUS, 10351 Bubb Rd., Cupertino, CA 95014. (408) 252-4444. (Jan '91)

4D Write ttt/2

4D Write is a word-processing module that works with 4th Dimension. Although you can't replace a full-blown word-processing program with 4D Write, it has basic features such as formatting, rulers, and the capability to handle simple graphics. Lacks a spelling checker and style sheets. 4D Write sometimes has difficulty opening large text files, and translation of imported RTF (rich text format) documents is not good, although you can specify RTF when saving documents. Version 1.0 reviewed. Requires 4th Dimension 2.1.1 or later. \$295. ACIUS, 10351 Bubb Rd., Cupertino, CA 95014. (408) 252-4444. (June '91) 4D XREF \$\$\$\frac{1}{2}\fra

lytical tool that every 4D developer will cherish. It's simply a module that lists and cross-references all the different variables, procedures, commands, externals, structure elements, and layouts you have used in a 4D database. The entire XREF file can be saved as a text file for use in other applications. Listings provided (including Layouts and Structure) allow for clear, graphically intuitive analy-ses of procedures, layout dimensions, and structure maps. Version 1.0 reviewed. Requires 4th Dimension 2.1.1 or later. \$200. ACIUS, 10351 Bubb Rd., Cupertino, CA 95014. (408) 252-4444. (June '91)

4th Dimension tttt

4th Dimension is a versatile relational-database manager that can create powerful stand-alone applications. Has a Pascal-like pro-

cedural language but also allows simplified database design, using standard layouts. Design environment provides easy linking of in-formation types. Good docu-mentation. Version 2.0.8 reviewed. Version 2.1.1 shipping. Requires Mac Plus or later and a hard-disk drive. \$795; \$395 for 4 run-time copies. ACIUS, 10351 Bubb Rd., Cupertino, CA 95014. (408) 252-4444. (Feb '90) * '87, 89 Eddy

DAtabase ####

DAtabase is a remarkably powerful, easy-to-use flat-file manager in a DA. Handles pictures, text, and numbers. Imports QuickDEX and other files. Version 1.12 reviewed. Version 1.5.1 shipping. Requires Mac Plus or later. \$129.95. Baseline Publishing, 1770 Moriah Woods Blvd., Ste. 14, Memphis, TN 38117. (800) 926-9676 or (901) 682-9676. (Nov '89)

Double Helix tttt

Double Helix is a relational-database manager that can work in a multiuser environment. Its iconbased development system makes database creation easy. Version 3.5 shipping. Requires Mac Plus or later and a hard-disk drive, \$695. Odesta Corp., 4084 Commercial Ave., Northbrook, IL 60062. (800) 323-5423 or (708) 498-5615. (Feb '90)

File \$\$\$

File is a basic flat-file database manager. Has 100 forms templates that work with standard preprinted business forms. Version 2.0 ship-ping. Requires Mac 512K or later. \$195. Microsoft Corp., One Microsoft Way, Redmond, WA 98052. (800) 426-9400 or (206) 882-8080. (Nov '89)

File Force tttt

File Force is a relational-database manager. Script editor provides a graphic way to view database file structures, establish file relations, and access layouts. Excellent documentation. Version 1.0.1 shipping. \$395. ACIUS, 10351 Bubb Rd., Cupertino, CA 95014. (408) 252-4444. (Sept '90)

FileMaker Pro \$\$\$\$

The database manager FileMaker Pro is ideal for novices but has the power to run large, sophisticated databases. It offers flexible layouts, good searching/sorting functions, many data-entry options, and reporting capabilities. It has most of the features of a relational-database manager but for a much lower price, and several users on an AppleTalk network can access and modify one FileMaker database without requiring a dedicated server. File-Maker tends to favor reliability over processing speed, so Macs with 68000 CPUs or slow hard drives may feel sluggish. Version 1.0v1. reviewed. Version 1.0v2 shipping. Requires Mac Plus or later (hard-disk drive recom-

mended), \$299. Claris Corp., 5201 Patrick Henry Dr., Santa Clara, CA 95052. (800) 544-8554 or (408) 727-8227. (Mar '91) ★ '86 Eddy

Filevision IV \$\$\$
Filevision IV is a picture-oriented flat-file database manager. Still the application of choice for graphics/text-integration projects but not for straight-text uses. Version 1.1 shipping. Requires Mac Plus or later. \$295. TSP Software, 4790 Irvine Blvd., Ste. 105-294, Irvine, CA 92720. (714) 731-1368. (Nov '89) FoxBASE+/Mac \$\$\$\$/2

FoxBASE+/Mac is a relationaldatabase manager that can read unmodified dBASE III Plus applications. Amazingly fast. Good emulation of dBASE on the Mac. Version 1.0 reviewed. Version 2.01 shipping. Requires Mac Plus or later, System 5.0 or later, and a hard-disk drive. \$495; multiuser version, \$695. Fox Software, Inc., 134 W. South Boundary, Perrysburg, OH 43551. (419) 874-0162. (Sept '88) ★ '88 Eddy

MBA Clients tttt

MBA Clients is a set of 11 multiuser business applications that run under ACIUS' 4th Dimension. It's also an automated programming environment for developing additional 4th Dimension applications. NetMail, version 1.05; all others, version 1.0 reviewed. Version 2.0.2 shipping. Requires Mac Plus or later and 4th Dimension. \$189 per application. Generation Four, Inc., 10701 Lomas Blvd. N.E., Ste. 110, Albuquer-que, NM 87123. (505) 294-3210. (May '89)

Omnis 5 tttt/2

Omnis 5 is primarily a developer's tool. It's a powerful graphicsoriented multiuser relational/hierarchical-database manager. Its interface - although improved over Omnis 3's — still isn't en-tirely Mac-like. Comes with HyperCard externals for creating HyperCard front ends. Version 1.0 reviewed. Version 1.2 ship-ping. Requires Mac Plus or later and hard-disk drive. Single user, \$1,000; each additional user, \$200. Blyth Software, Inc., 1065 E. Hillsdale Blvd., Foster City, CA 94404. (800) 346-6647 or (415)

571-0222. (Sept '89) Panorama \$\$\$\$\%2

Panorama is a very powerful and classy flat-file database manager. Stores databases in RAM for speed. Spreadsheetlike data entry. Supports text, numbers, graphics, and dates as data types. Also offers powerful charting function and macros. Version 1.0 reviewed. Version 1.5 shipping. Requires Mac Plus or later and System 4.2 or later. \$395, ProVUE Development, Inc., 15180 Transistor Ln., Huntington Beach, CA 92649. (714) 892-8199. (Nov '89) * '88 Eddy

RecordHolderPlus ###

RecordHolderPlus is a middle-ofthe-road flat-file database manager with above-average functionality. Has the best editing functions available. Good choice for a high-volume application where editing can make all the difference. Version 3.1 shipping. Requires Mac Plus or later. \$149.95. Software Discoveries, Inc., 137 Krawski Dr., South Windsor, CT 06074. (203) 644-9225. (Nov '89) ★ '87 Eddy

DESKTOP PUBLISHING

Cheshire \$\$\$\$ Cheshire is an INIT that lets you copy and paste tab-delimited data into simple charts, which can be placed in a document. Many chart types are possible, typeface styles can be varied, and the charts can be modified if placed into drawing programs such as MacDraw II or DeskDraw. The only programs from which this handy utility can extract data are MacWrite II, Word, MacDraw II, and Page-Maker. Version 1.0 reviewed. \$125. Abbott Systems, 62 Mountain Rd., Pleasantville, NY 10570. (800) 552-9157 or (914) 747-4171. (Feb '91)

if:X Forms Designer \$\$% This application, from the publisher of MacInTax, takes a highly innovative approach to the electronic design of business forms. if:X Forms Designer has many limitations as a database manager and suffers from a steep learning curve but has some advantages as a graphics environment. The program has good typeface control and many automated functions that speed form creation. However, the lack of support for in-dustry-standard multipart forms and serious database-management features cripple this application. Version 1.1 reviewed. \$279. Soft-View, Inc., 1721 Pacific Ave., Ste. 100, Oxnard, CA 93033. (805)

385-5000. (Feb '91) PrePrint tttt

Intended as a sophisticated colorseparation printing utility for PageMaker documents, PrePrint does its job as well or better than Adobe Separator. Although PrePrint handles color TIFF and EPS files with no problem, results can be unpredictable with PICT images, Version 1.0 reviewed. \$495; free upgrade from Page-Maker Color Extension. Aldus Corp., 411 First Ave. S., Seattle, WA 98104. (800) 333-2538 or (206) 628-2320. (Jan '91)

FONTS & TYPOGRAPHY

The Art Importer tttt

The Art Importer creates Post-Script fonts containing up to 256 graphic characters. Accepts ob-ject-oriented PICT and EPS graphics. As fonts, graphics can be used in programs that don't normally accept them, and resizing is as easy as changing the point size. Supports color art. Math-coprocessor version available. Version 2.0 reviewed. Requires Mac Plus or later and System 5.0 or later. \$149; version for Macs with a math coprocessor, \$159. Altsys Corp., 269 W. Renner Rd., Richardson, TX 75080. (214) 680-2060. (Apr '90)

ATM (Adobe Type Manager)

Adobe Type Manager creates smooth screen fonts at any type size and dramatically improves output on QuickDraw printers such as Apple's ImageWriter II. Not quite perfect (has some problems with Microsoft Word and smaller point sizes) and has slow performance on 68000 Macs. Version 1.01 reviewed. Version 2.0 shipping. Requires Mac Plus or later and System 6.0 or later.

\$99. Adobe Systems, Inc., 1585 Charleston Rd., P.O. Box 7900, Mountain View, CA 94039. (800) 344-8335 or (415) 961-4400. (Feb '90) * '89 Eddy

Evolution \$\$\$ Evolution is an easy-to-use conversion utility for transferring fonts among Type 1, Type 3, and EPS formats. Comparable with Altsys' Metamorphosis font converter, but doesn't produce AFM (Adobe Font Metrics) files. Sensitivity controls do help with difficult conversions that Metamorphosis can't handle, and Evolution can output character sets as printer fonts. Evolution doesn't automatically hint converted fonts, however. If you are doing many font conversions, keep an eye out for a newer program called Font-Monger (from Ares). Version 1.02 reviewed. Requires Mac Plus or later, System 6.0.4 or later, and a hard-disk drive. \$99. Image Club Graphics, Inc., 1902 Eleventh St. S.E., Ste. 5, Calgary, Alberta T2G 3G2, Canada. (800) 661-9410 or (403) 262-8008. (May '91)

FONTastic Plus ttt FONTastic Plus lets you customize and create bit-mapped fonts. It's easy to add or modify characters. This version edits screen fonts in very large sizes and supports Apple's NFNT format, Version 2.01 reviewed, Version 2.02 shipping. Requires Mac 512Ke or later. \$99.95. Altsys Corp., 269 W. Renner Rd., Richardson, TX 75080.(214)680-2060.(May 89)

Fontina tttt/2 Fontina is a font-control program that shows all your fonts simultaneously, in multiple columns if needed. No scrolling is required. Correctly organizes font families. Can show fonts in any selected face and size. The Fontina INIT is trouble-free, and performance is excellent. Version 1.0 reviewed. Requires Mac Plus or later, \$69.95.

Eastgate Systems, P.O. Box 1307, Cambridge, MA 02238. (617) 924-9044. (Sept '90)

FontLiner tttt

FontLiner converts Fontographercreated typefaces into PostScript outline fonts editable in Illustrator and FreeHand. Version 1.0 reviewed. Requires Mac Plus or later. \$129.95. Taylored Graphics, P.O. Box 1900, Freedom, CA 95019, (408) 761-2481, (July '89)

Fontographer \$355 Fontographer 3.0 is an upgrade of the top PostScript-font editor/ generator. New features include an integrated screen-font editor, auto-tracing, and a pen tool. This professional application can include PostScript hints within your fonts. Screen-font editor automatically generates bit-mapped fonts but is strictly bare bones. Can also be used for creating logos but should have better drawing tools for this. Version 3.0 reviewed. Version 3.2 shipping. Requires Mac Plus or later and System 5.0 or later. \$495. Altsys Corp., 269 W. Renner Rd., Richardson, TX 75080. (214) 680-2060. (Jan '90)

FontSizer II \$\$\$\$%

FontSizer II creates high-quality screen fonts of any downloadable PostScript typeface in sizes up to 96 points. Excellent utility for producing large font sizes with true WYSIWYG. Version 1.7 reviewed. Version 2.0 shipping. Requires Mac Plus or later, System 5.1 or later, and a PostScript printer. \$99.95. U.S. MicroLabs, Inc., 1611 Headway Cir., Bldg. 3, Austin, TX 78754. (800) 622-2177 or (512) 339-0001. (Apr '89)

FontStudio \$\$\$\$% FontStudio provides a fully integrated environment for typography on the Mac. If you're in the market for a font-production system for the first time, FontStudio might prove to be irresistibly attractive because of its ability to store character parts in a library, its excellent bit-map editor, and its strong kerning-pairs interface. Its most significant failing is its lack of automated hinting. Version 1.0 reviewed. Version 1.01 shipping. Requires Mac Plus or later and a hard-disk drive. \$595. Letraset USA, Inc., 40 Eisenhower Dr., Paramus, NJ 07653. (800) 343-8973 or (201) 845-6100. (Sept

Formulator \$\$\$%

Formulator is a mathematical application that incorporates a rudimentary word processor as well as an equation writer. It comes with a helpful HyperCard demonstration stack, and the section on importing equations into a wordprocessing program is very clear. Version 1.1 shipping. Requires Mac Plus or later, \$99.95. ICOM Simulations, Inc., 648 S. Wheeling Rd., Wheeling, IL 60090. (708) 520-4440. (July '90)

Hermes & Tribune Fonts #### ½

Hermes & Tribune Fonts are specially designed fonts that come in sizes up to 120 points. Optimized for the ImageWriter LQ, the LaserWriter IISC, and fax modems, these fonts look better than Apple's fonts and can replace Helvetica and Times. Requires a non-PostScript high-resolution printer. \$49,95. Miles & Miles, 704 N. Water#1, Ellensburg, WA 98926. (509) 925-5280. (Sept '89)

KernEdit \$\$\$\$ KernEdit is a basic kerning program with a rather un-Mac-like interface. Word View is a nice feature that greatly simplifies kerning-table creation. Maximum resolution is 1/1,000 em. There are 19 kerning-table packages, each containing 25 tables. Version 1.06 reviewed. Version 1.08 shipping. Requires Mac Plus or later. \$149; additional kerning-table packages, \$95 each. Pairs Software, Inc., 160 Vanderhoof Ave., Ste. 201, Toronto, Ontario M4G 4B8, Canada, (416) 467-8784. (Apr

KeyCap Fonts 1111

KeyCap Fonts contains three typefaces designed specifically for writing computer documentation. Version 1.0 reviewed. Version 1.1 shipping. \$149.95. Paperback Software International, 2830 Ninth St., Berkeley, CA 94710. (800) 255-3242 or (415) 644-2116. (June '89)

LetraStudio \$\$\$\$

LetraStudio is a type-customization program for creating headlines, logos, signs, and other fancy display type. Lets you create unique distortion effects. Works with LetraFont typefaces or Type 1 fonts. Version 1.0 reviewed. Version 1.53 shipping. Requires Mac Plus or later and a hard-disk drive. \$495; LetraFont typefaces, \$75 each. Letraset USA, Inc., 40 Eisenhower Dr., Paramus, NJ 07653. (800) 343-8973 or (201) 845-6100. (May '89) * '88 Eddy

LetrTuck \$\$\$

LetrTuck is a kerning utility that lets you add, delete, or modify the kerning pairs for any installed screen font in the System file, Font/DA Mover suitcases, or QuarkXPress documents. Version 1.04 reviewed. Version 3.0 shipping. \$99. EDCO Services, 12410 N. Dale Mabry Hwy., Tampa, FL 33618. (800) 523-8973 or (813) 962-7800. (June '89)

Letterforms and Illusions

Letterforms and Illusions is a set of fonts and figures by Scott Kim that leads you into exciting typographic explorations. Includes a limited version of MacPaint. Requires Mac Plus or later. \$39.95. W. H. Freeman & Co., 41 Madison Ave., New York, NY 10010. (212) 576-9400. (Mar '90)

MacTography Type Sampler

The MacTography Type Sampler is a classic art director's type book that has samples of all PostScript laser fonts. The material is searchable on-disk, but screen resolution is poor. The printed version of Type Sampler is the more valuable part of this package. Requires Mac Plus or later. \$75; one year of printed updates, \$80. MacTography, 326-D N. Stonestreet Ave., Rockville, MD 20850. (301) 424-3942. (Apr '90)

MasterJuggler tttt MasterJuggler is a font/DA utility loaded with features, including constant access to hundreds of fonts, DAs, Fkeys, and sounds. A world-class utility. Version 1.53 shipping. Requires System 6.0.3 or later, \$89.95. ALSoft, Inc., P.O. Box 927, Spring, TX 77383. (713) 353-4090. (Mar '89)

Publishing Packs ttt/2

Publishing Packs bundles three Adobe typefaces that work well together for specific publishing projects. The packages offer substantial savings over purchasing the typefaces individually, and the documentation has useful typeface information. Version 3 shipping. Requires Mac Plus or later. Publishing Pack 1 (Newsletters), \$395; Publishing Pack 2 (Forms and Schedules), \$475; Publishing Pack 3 (Presentations), \$475. Adobe Systems, 1585 Charleston Rd., P.O. Box 7900, Mountain View, CA 94039. (800) 344-8335 or (415) 961-4400. (Feb '89)

capabilities that let you open 99 font, DA, sound, or Fkey files at a time. Can display any installed font in any style. Fonts can also appear in their proper typefaces on the font menus. Includes Font Harmony for resolving font-ID conflicts, and Font & Sound Valet for font and sound compression. Version 1.2.2 reviewed. Version 1.2.10 shipping. Requires Mac 512Ke or later and System 4.1 or later. \$79. Fifth Generation Systems, 10049 N. Reiger Rd., Baton Rouge, LA 70809. (800) 873-4384 or (504) 291-7221. (June '89) * '87 Eddy

TypeAlign \$\$\$\$\% TypeAlign is an INIT/DA utility that is helpful for DTP work if you use ATM (Adobe Type Manager). The program lets you place text along circular, angled, or arbi-trary paths. It could use the Clipboard better, but the simple effects are easy to control and the results are striking. Version 1.0.2 reviewed. Version 1.0.4 shipping. Requires Mac Plus or later, System 6.0.2 or later, ATM, and a hard-disk drive. \$99. Adobe Systems, 1585 Charleston Rd., P.O. Box 7900, Mountain View, CA 94039. (800) 344-8335 or (415) 961-4400. (May '90) ★ '89 Eddy TypeStyler tttt

TypeStyler is a type-customization program that lets you manipulate regular type to create display type. It supports 8-bit color and can output files as processcolor separations. Its performance is excellent except on low-end Macs where it might be unacceptably slow. Includes ten fonts. Version 1.0 reviewed, Version 1.5 shipping, Requires Mac Plus or later, \$199.95, Brøderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903. (800) 521-6263 or (415) 492-3200. (May '90) ★ '90

World Class Fonts! \$\$\$\$

World Class Fonts! is bit-mapped screen fonts that come with three useful utilities, all the Mac the Knife fonts, and a lot more. Eight separate volumes are available. \$89.95 per volume. Dubl-Click Software, Inc., 9316 Deering Ave., Chatsworth, CA 91311. (818) 700-9525. (Oct '86)

World Class Laser Type tttt World Class LaserType is a sixvolume collection of PostScript fonts that are an attractive alternative to more expensive fonts. Each volume is on two 800K disks and includes screen fonts and Type 3 PostScript printer fonts. An excellent value. BigCaps, version 3.2: FontCharter, version 2.2 reviewed. Requires PostScript printer. \$89.95 per volume. Dubl-Click Software, Inc., 9316 Deering Ave., Chatsworth, CA 91311. (818) 700-9525, (Dec '89)

PAGE LAYOUT

CopyFlow \$\$\$\$

CopyFlow is a QuarkXPress XTension that allows batch importing or exporting. Adds its own menu to Quark XPress. CopyFlow automates placement after you've completed your revisions. Works well and can be a real time saver. Version 2.0 reviewed. Requires QuarkXPress. \$395. North Atlantic Publishing Systems, P.O. Box 682, Carlisle, MA 01741. (508) 369-1931. (Sept '90)

DesignStudio \$\$\$%

DesignStudio is based on Ready, Set, Go! but is more than just a beefed-up version of that program. It has new layout-management features, and its handling of text, graphics, and color is good. It duplicates many of RSG's drawbacks, however. Performance needs to be improved considerably, and a totally new manual would be helpful. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac SE/30 with a hard-disk drive or Mac II series. \$795. Letraset USA, Inc., 40 Eisenhower Dr., Paramus, NJ 07653. (800) 343-8973 or (201) 845-6100. (June '90)

Fast Forms \$\$\$\$\%

Fast Forms is a modest, inexpensive forms-design program directed primarily at low-end users.

Its manual is a joy to read. Fast Forms can import and export comma- and tab-delimited files and can handle scanned images of preexisting forms. It lets you create fields and overlay them on a scanned image. The FastForms Filler feature lets you fill out forms without needing the original program. Can't import EPS graphics. Version 2.0 shipping, \$179.95. Power Up Software Corp., 2929 Campus Dr., San Mateo, CA 94403. (800) 851-2917 or (415) 345-5900. (Sept '90)

FlexForm Business Templates

FlexForm Business Templates is two volumes of prepackaged business forms. Includes Smart-Form Assistant. Volume I contains stockkeeping, production, sales, billing, and collection forms. Volume II has purchasing, receiving, accounting, disbursing, and personnel business forms. \$89.95 per volume. Formula, Inc., 1160 Industrial Ave., Ste. J. Petaluma, CA 94952. (707) 763-9944. (Jan '90) FrameMaker \$\$\$\$\%

FrameMaker is a powerhouse program for long-document publishing. Provides extensive power for creating paragraph formats. Its 130,000-word spelling checker works well and quickly. Powerful cross-referencing. Poor table formatting. Imports standard Mac graphics as well as DOS, EPS, and Sun raster files. Version 2.1 shipping. Requires SE/30 or Mac II, System 6.0.3 or later, a 40megabyte hard-disk drive, 4 megabytes of RAM, PostScript printer, and a large-screen monitor. \$995. Frame Technology, 1010 Rincon Cir., San Jose, CA 95131. (408) 433-3311. (Nov '90)

Informed Designer 1111 Informed Designer is a complex and comprehensive forms-design program primarily for high-end corporate users. Capable of ac-curacy to 1/1.152 degree. Draws lines from .25 point to 999 points thick. Can import or export almost anything. Can take any object and rotate, replicate, duplicate, or resize it ad infinitum. More than 150 mathematical, financial, and statistical functions. Related program, Informed MiniManager, is a complete flat-file database manager that lets you merge or import forms data in various ways. Version 1.0.1 shipping. Requires Mac Plus or later. \$295; Informed MiniManager, \$99. Shana, Advanced Technology Center, 9650 20th Ave., Ste. 105, Edmonton, Alberta T6N 1G1, Canada. (403) 463-3330. (Sept '90) Interleaf Publisher \$\$\$\%

Interleaf Publisher is a speedy multiuser layout system for producing large, complicated documents. This version has an improved user interface, but it suffers from poor font management.

Version 3.5 reviewed, Version 3.6 shipping. Requires Mac II series with 5 MB of RAM and a harddisk drive. \$995; upgrade, \$99. Interleaf, Inc., Prospect Place, 9 Hillside Ave., Waltham, MA 02154. (800) 456-5323 or (617) 290-0710. (Apr '89)

Layouts ###

Layouts is a five-disk set of PageMaker templates. The business-document templates are excellent. The superb manual has money-saving printing tips. Ver-sions for QuarkXPress and Ready, Set, Go! are also available. Requires Mac Plus or later and PageMaker. \$149.95 for each version. Postcraft International, Inc., 27811 Ave. Hopkins, Ste. 6, Valencia, CA 91355. (805) 257-1797. (May '90)

Multi-Ad Creator \$\$\$\$1/2

Multi-Ad Creator is a powerful tool that lets you create high-quality single-page ads. It is easy to use and is nearly foolproof (but it lacks a good-taste feature). Every kind of graphic file and most wordprocessor files can be imported. If you create ads and don't need an all-purpose page-layout program, get Multi-Ad Creator. Version 2.5 shipping. Requires Mac Plus or later with 2 MB of RAM and a hard-disk drive (Mac II series recommended), \$995. Multi-Ad Services, Inc., 1720 W. Detweiller Dr., Peoria, IL 61615. (800) 447-1950 or (309) 692-1530. (Jun '90)

PageMaker tttt PageMaker 4.0 is a major upgrade of Aldus' popular page-layout application. It adds 75 new features without complicating the program. The new version's range of improvements is impressive. PageMaker is accessible and significantly improved in its wordprocessing, typography, graphics, links management, long-document processing, color, and tableprocessing capabilities. Requires Mac Plus or later and a hard-disk drive. \$795; upgrade, \$150. Aldus Corp., 411 First Ave. S., Seattle, WA 98104. (800) 333-2538 or (206) 628-2320. (Sept '90) ★ '85, 87. '88 Eddy

PDQ! (Page Designs Quick!)

PDQ! (Page Designs Quick!) and PDQ! 5 (Page Designs Quick! 5) are PageMaker templates designed exclusively for newsletter and newspaper publishing. The two sets contain 60 three-column; 60 four-column; and 225 tabloidsized, five-column layouts. The quality is excellent, but art is lacking. You can modify all layouts from within PageMaker. Version 1.0 shipping. Requires Page-Maker 3.0 or later. PDQ!, \$89.95; PDQ! 5, \$159.95. PAR Publishing, 6355 Topanga Canyon Blvd., Ste. 307, Woodland Hills, CA 91367.(818)340-8165.(Aug '90)

Personal Press 1111/2 Personal Press is a budget page-

layout program. Lots of good features. Has style-sheet support, good TIFF-halftone controls, and spot-color cutouts. AutoCreate feature simplifies design and production of templates. Easy to use yet powerful enough for basic DTP projects. Needs ample memory and disk space. Editing in 100-percent view only. Screen refresh occasionally slow. Can have only one document open at a time. Version 1.0 reviewed. Requires Mac Plus or later with 2 MB of RAM, System 6.0.3 or later, and a hard-disk drive. \$299. Aldus Corp., 411 First Ave. S., Seattle, WA 98104. (800) 333-2538 or (206) 628-2320. (July '91)

Publish It! tttt

Publish It! is a moderately priced page-layout package designed for users with basic page-layout requirements. Includes word-processing and simple drawing and painting tools. Uses a frame metaphor. Can rotate text. Limited color support. Version 1.1 reviewed. Version 1.2 shipping. Requires Mac Plus or later; hard disk and System 6.0.3 or later recom-mended. \$495. Timeworks, Inc., 444 Lake Cook Rd., Deerfield, IL 60015. (800) 535-9497 or (708) 559-1300. (Dec '89)

Publish It! Easy tttt/2 Publish It! Easy is a budget DTP application with loads of features (including some missing in highend programs). Menus and dialog boxes are uncrowded and simple to use. Good typographical controls. Easy text and graphic importation, Includes service-bureau checklist, slide-show feature for presentations, and mail-merge module. Lacks real style sheets. Documents limited to 100 pages. Can't turn off master elements. Version 2.01 reviewed. Requires Mac Plus or later and System 6.0.3 or later. \$249.95. Timeworks, Inc., 444 Lake Cook Rd., Deerfield, IL 60015. (800) 535-9497 or (708) 559-1300. (July '91) ★ '90 Eddy

QuarkStyle tttt QuarkStyle is a simple program that has a collection of 72 templates for "instant" desktop publishing. The templates, which range from business cards to newsletters, let you concentrate on a page's overall appearance rather than its details. Version 1.0 reviewed. Version 1.01 shipping. Requires Mac Plus or later and hard-disk drive, \$295, Quark, Inc., 300 S. Jackson, Ste. 100, Denver, CO 80209. (800) 356-9363 or (303) 934-2211. (Feb '89)

QuarkXPress \$\$\$\$% QuarkXPress 3.0 has wonderful new features, and the interface has been greatly simplified. It lets you have as many as 127 different retroactive master pages per document. The program lets you drag objects completely off a page and use the space outside the page as a pasteboard. You can also ro-

MINIFINDERS

tate any object or group in increments as fine as .001 degree. As many as seven documents can be open simultaneously. Version 3.0 reviewed. Requires Mac Plus or later with 2 MB of RAM and a hard-disk drive. \$795. Quark, Inc., 300 S. Jackson, Ste. 100, Denver, CO 80209. (800) 356-9363 or (303) 934-2211. (Nov '90) * '89

RagTime ttt/2

RagTime combines word-processing, page-layout, graphics, and spreadsheet capabilities. It has a wide array of charts, hyphenation dictionaries in 14 languages, and an integral word processor that can check spelling in 8 languages. Linked spreadsheets within the same or other documents update automatically. Offers 80 functions, and you can add external functions for importing data from SQL databases. It also has page-layout functions such as the ability to flow text around frames and to adjust color and tint. Its number-crunching capabilities are minimal. Version 3.1 shipping. Requires Mac Plus or later with 2 MB of RAM, System 6.0.2 or later, and a hard-disk drive. \$599. RagTime USA, Inc., 702 Marshall St., Ste. 322, Redwood City, CA 94063. (800) 875-9632 or (415) 780-1800. (Jun '90)

RagTime Classic \$\$ RagTime Classic, a simplified version of RagTime, is a budget page-layout program. Includes spreadsheet module and control over TIFF halftones. Lacks style sheets or layout rulers. Very limited text-import options - only ASCII, Word 1.0, and MacWrite 5.0. Copy protection using keydisk system. Confusing, incomplete documentation but toll-free support. Version 2.1 reviewed. Requires Mac Plus or later and System 5.0 or later (hard-disk drive recommended). \$195. RagTime USA, Inc., 702 Marshall St., Ste. 322, Redwood City, CA 94063. (800) 875-9632 or (415) 780-1800. (July '91) Ready, Set, Go! \$\$\$

Ready, Set, Go! is a low-budget DTP program. Elegant interface. Good style sheets, typographical controls, gray-scale halftone control, and spot color. Provides thumbnail views of publications. Stores font-name information within documents, which avoids font-ID conflicts. Easy to use. Limited graphic tools. Version 4.5a reviewed. Requires Mac Plus or later and a hard-disk drive. \$295. Letraset USA, Inc., 40 Eisenhower Dr., Paramus, NJ 07653. (800) 343-8973 or (201) 845-6100. (July '91) * '86 Eddy

SmartForm Designer tttt SmartForm Designer is a fullfeatured forms-design manager. Includes SmartForm Assistant for filling out forms when design is complete. This easy-to-use design environment can import color graphics. Version 1.1 reviewed. Version 1.1.v1 shipping, Requires Mac Plus or later. \$399. Claris Corp., 5201 Patrick Henry Dr., Santa Clara, CA 95052. (800) 544-8554 or (408) 727-8227. (Jan '90)

Springboard Publisher II tt Springboard Publisher II is a lowend, very basic, template-based DTP package. Typing window allows simplified text entry. Text and graphics editing only in Actual Size view. Black-and-white painting tools; can't color text but includes SmartArt DA. No support for TIFF halftones. Clumsy textframe linking. No spot color, master pages, or style sheets. Imports standard word-processing documents. Version 2.0 reviewed. Requires Mac Plus or later. \$199.95. Spinnaker Software Corp., 201 Broadway, Cambridge, MA 02139. (800) 323-8088 or (617) 494-1200. (July '91)

TrueForm tttt TrueForm creates an electronic form by superimposing a layout over a scanned image of an existing paper form or by importing layouts from another design environment. No design capabilities. Automatic field definition. Has form-caching capability for faster printing. Version 2.0 reviewed. Requires Mac Plus or later and System 6.0.3 or later. \$395. Adobe Systems, Inc., 1585 Charleston Rd., P.O. Box 7900, Mountain View, CA 94039. (800) 344-8335 or (415) 961-4400. (Jan

Ventura Publisher Macintosh Edition 111

The Mac version of Ventura Publisher, the venerable PC pagelayout program, still feels like a PC product, despite its considerable strength in technical and longdocument publishing. Even if you're willing to forgive its clumsy adaptation to the Mac interface, Ventura still has two major problems: First, it leaves all imported text and graphics files separate from the Ventura document, which lets the Ventura document remain compact but requires constant tracking of the other linked files; second, typeface management is unreliable if you need professional results. Version 3.0 reviewed. Version 3.0.1 shipping. Requires at least 3 MB of RAM and at least 4 MB of space on a hard-disk drive. \$795. Ventura Software, 15175 Innovation Dr., San Diego, CA 92128. (800) 822-8221 or (619) 673-0172. (May '91)

PRESENTATIONS

CA-Cricket Presents 1111

CA-Cricket Presents is a presentation tool with a strong graphics emphasis. Good master template. Lacks text-import capability. Version 2.0.1 shipping. Requires Mac Plus or later, System 6.0.3 or later, and a hard-disk drive. \$199.

Computer Associates International, Inc., 1240 McKay Dr., San Jose, CA 95131. (800) 531-5236 or (408) 432-1727. (Dec '88)

MORE tttt

MORE's outlines can be instantly transformed into presentations. Dozens of templates are provided, and users can also design their own. There is a wide choice of customizable labeling schemes. Slide-making tools are formidable. Version 1.0 reviewed. Version 3.0 shipping. Requires Mac Plus or later, System 6.0.3 or later, and a hard-disk drive. \$395; upgrade for existing users, \$50. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014. (800) 441-7234 or (408) 253-9600. (Oct '90) ★ '86, '90 Eddy

Persuasion ttttt

Persuasion is the premier desktop presentation program. Templating and outlining capabilities are much improved, and slide shows are handled well. Few flaws. Version 2.0 reviewed. Requires Mac Plus or later, System 6.0.3 or later, and a hard-disk drive. \$495. Aldus Corp., 411 First Ave. S., Seattle, WA 98104. (800) 333-2538 or (206) 628-2320. (Apr '90) ★ '88 Eddy

PowerPoint ttt

PowerPoint is an easy-to-use desktop presentation tool. Good color schemes. Can send presentations to Genigraphics to produce color 35mm slides. Version 2.0 reviewed. Version 2.01 shipping. Requires Mac Plus or later and System 6.0.3 or later (hard-disk drive recommended). \$395. Microsoft Corp., One Microsoft Way, Redmond, WA 98052. (800) 426-9400 or (206) 882-8080. (Aug '87) * '87 Eddy

Visual Business No. 5 ttt

Visual Business No. 5 is a port of a DOS charting and presentation package. Excellent charting capabilities, including 3-D. More difficult to learn and use than Persuasion or PowerPoint, Can't store an entire presentation. Output Manager is included for slide printing. Includes four Laser-Writer fonts. Not a good choice unless you specifically need one of its features. The redesigned program GraphMaster will replace Visual Business No. 5. Version 1.02 shipping. Requires Mac II and System 6.0.3 or later; 2 MB of RAM needed for Output Manager, \$295. Visual Business Systems, 380 Interstate N. Pkwy., Ste. 190, Atlanta, GA 30339. (404) 956-0325. (Oct '89)

EDUCATION

Alphabet Blocks tttt

Alphabet Blocks teaches prereaders the letters and sounds of the alphabet. The on-screen elf's digitized voice is clear and pleasant. Very intuitive. Version 1.0 reviewed. Version 1.10 shipping. Requires Mac Plus or later. \$59.95. Bright Star Technology, Inc., 1450 114th Ave. S.E., Ste. 200, Bellevue, WA 98004. (206) 451-3697. (May '88)

Course Builder tttt

Course Builder creates standalone educational applications. This easy-to-learn dedicated programming language uses blocks and arrows, Graphics, animation, and sound can be integrated. Poor documentation. Version 2.0 reviewed. Version 4.0 shipping. Requires Mac Plus or later with 2 MB of RAM and hard-disk drive. \$1,495. TeleRobotics International, 7325 Oak Ridge Hwy., Ste. 104, Knoxville, TN 37921. (615) 690-5600. (Oct '87)

Interactive Physics tttt

Interactive Physics is the best physics-teaching tool - short of a laboratory -- you can buy. Students set up and run experiments, using a drawing environment; attach objects with various strings and springs; and then watch the animated results on-screen. There are limits to the number of masses and connectors, but that doesn't detract much from the overall program. Excellent manual. Version 1.2 shipping. Requires Mac Plus or later and System 6.0.3 or later (hard-disk drive recommended). \$249. Knowledge Revolution, 497 Vermont St., San Francisco, CA 94107. (800) 766-6615 or (415) 553-8153. (Apr '90) * '89 Eddy

KidsMath ttt KidsMath is a set of eight educational applications for ages 3 to 8. The quality ranges from adequate to superb. Doesn't support color or large monitors. Version 1.1 shipping. Requires Mac 512Ke or later. \$49.95. Great Wave Software, 5353 Scotts Valley Dr., Ste. E, Scotts Valley, CA 95066. (408)

438-1990. (May '90) MacPhotography Workshop

MacPhotography Workshop is a seven-disk program that teaches basic camera and darkroom techniques. Animated simulations and hypertext make learning blackand-white photography easy. Designed for both self-instruction and classroom use. Requires Mac Plus or later, \$79.95. Joe Ciaglia, 2036 Spruce St., Philadelphia, PA 19103. (215) 985-1092. (Sept '90)

Mavis Beacon Teaches

Typing! #### Mavis Beacon Teaches Typing! has more features than a Selectric. Lots of diagnostics concerning typos. Incomplete documentation. Version 1.1 reviewed, Version 1.3 shipping. Requires Mac 512Ke or later. \$49.95. Software Toolworks, 60 Leveroni Ct., Nova-to,CA 94949. (800) 231-3088 or (415) 883-3000. (Nov '88)

Number Munchers 1111 This educational arcade game is aimed at grades 3 to 12. Teaches a

variety of skills for multiplication, factors, primes, equalities, and inequalities. The easy levels are easy and the hardest levels are challenging. Adaptable to the classroom. Requires Mac Plus or later. \$49.95. MECC, 3490 Lexington Ave. N., St. Paul, MN 55126. (800) 228-3504 or (612) 481-3500. (Oct '90)

NumberMaze tttt/2 NumberMaze makes practicing basic math skills a game. Children ages 5 through 12 can work their way through various mazes by solving numerical and word problems in counting, addition, subtraction, multiplication, and division. Can select problem types and difficulty. Games can be customized with familiar names and additional levels. Based on five major math-textbook series for grades 1 through 6. Version 1.0 shipping. Requires Mac 512K or later; color-capable Mac for color version, \$49.95; Number-Maze Color, \$69.95. Great Wave Software, 5353 Scotts Valley Dr., Ste. E, Scotts Valley, CA 95066. (408) 438-1990. (Dec '89) ★ '88

Physics ###

Physics is a capable, intelligent, well-designed study aid. Covers topics from vectors to thermodynamics to the nature of light. Animated experiments let you try out concepts. Version 1.2 ship-ping. Requires Mac Plus or later. \$99.95. Brøderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903. (800) 521-6263 or (415) 492-3200. (Jan '88)

The Playroom \$\$\$\$\$

The Playroom is a highly entertaining and educational program that teaches basic concepts, such as spelling, telling time, and counting, with style. It's centered around a child-sized room furnished with a multitude of objects that spring to life with just a click. Six of the room's objects lead into high-interest learning activities for the three-to-six-year-old set. Its only serious drawback is its copyprotection scheme. Version 1.0 shipping. \$49.95. Brøderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903. (800) 521-6263 or (415) 492-3200. (Sept '90) Point of View \$\$\$\$\$

Point of View is a dynamic history program that makes exploring American history interesting and fun. Comes with more than 2,000 pages of documents, hundreds of graphics, and 140 census tables, with tools for searching. accessing, and displaying the data. Contains many typographical errors and does not cite source quotations for any of its documents. Version 1.0 shipping. Requires Mac Plus or later (harddrive recommended). \$199.95. Scholastic Software, 730 Broadway, New York, NY 10003. (800) 541-5513 or (212) 5053000. (Nov '90)

Reader Rabbit ####

Reader Rabbit teaches four-toeight-year-olds how to read, with four elegant games that build on one another. A future version will support color and will fix minor incompatibilities with recent Mac OS versions. Version 2.0 reviewed. Version 2.2 shipping. Requires Mac 512Ke or later. \$59.95. The Learning Co., 6493 Kaiser Dr., Fremont, CA 94555. (800) 852-2255 or (415) 713-0230. (June '88)

Type! tttt/2

Type! is a typing tutorial that is both practical and flashy. Users can interrupt functions and move easily among them. Use of Return and space bar are assumed but never explained. Version 1.0 reviewed. Requires Mac 512KE or later. \$29.95. Brøderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903. (800) 521-6263 or (415) 492-3200. (Nov '88)

Typing Instructor Encore #### Encore is a Mac typing tutorial that - unlike many others on the market - recognizes that it's being used on a computer rather than a typewriter. Although the program is easy to control and offers good performance, it has some strange bugs. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later, \$29.95. Individual Software, Inc., 125 Shoreway Rd., Ste. 3000, San Carlos, CA 94070. (800) 331-3313 or (415) 595-8855. (Nov '88)

Voyager, the Interactive Desktop Planetarium \$111

Voyager, the Interactive Desktop Planetarium, lets you view the sky as a star chart, as a celestial sphere, or as seen from anywhere in the universe. Includes an extensive astronomical database. Terrific learning tool, Version 1.0 reviewed, Version 1.2 shipping, Requires Mac Plus or later and System 6.0.3 or later. \$124.50. Carina Software, 830 Williams St., San Leandro, CA 94577. (415) -7328. (Sept '89)

Where in Time Is Carmen

Sandiego? \$\$\$\$\\^2\)
Where in Time Is Carmen Sandiego? is the fourth in the popular Carmen Sandiego series. The previous releases use intriguing stories and characters to teach geography to young Macintosh users, but this package adds the element of time travel (sounds better than "history" and is much more fun). The story revolves around a time machine that Carmen and her gang are using to steal treasures from the past. The Acme Detective Agency has issued you a Chronoskimmer timetravel device, but only your ability to learn geographic clues can save the day! Version 1.0 re-viewed. \$49.95. Brøderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903. (800) 521-6263 or (415) 492-3200. (Apr '91)

ENTERTAINMENT

Armor Alley \$\$\$\$

More than an exercise in blowing up tanks, helicopters, and personnel, Armor Alley requires a solid understanding of military strategy, planning, and the value of human life. You are rewarded for saving lives rather than for ending them needlessly. The game offers ten levels of difficulty and lets you play against the computer or via modem against a remote Mac or PC. There's also a multiplayer mode for AppleTalk networks (each player must have a copy of the game). Armor Alley gives your brain a workout instead of letting you rely merely on hand/eye coordination. Version 1.0 reviewed. \$49.95. Three-Sixty Pacific, 2105 S. Bascom Ave., Ste. 380, Campbell, CA 95008. (408) 776-2187. (Feb '91)

Balance of the Planet \$\$\$\$

Balance of the Planet is similar to the classic game Balance of Power but with the object of securing global environmental survival. It's difficult to win, but eventually you should be able to get positive scores, and your awareness of environmental issues will be greatly enhanced. Players can set the basic bias of the game, ranging from pronuclear industrialist to extreme "green." Version 1.0 reviewed. \$49.95 Accolade, 550 S. Winchester Blvd., Ste. 200, San Jose, CA 95128. (800) 245-7744 or (408) 985-1700. (Aug '90)

Bomber \$\$\$\$

Bomber is a great HyperCard-based simulation. You attack Germany during WW II, flying a B-17. Great sound (you probably need 2 megabytes of RAM). Headphones are provided so you don't disturb others. Version 2.0 shipping. Requires HyperCard 2.0 (included) and a hard-disk drive. \$49.95. Inline Design, 5 W. Mountain Rd., Sharon, CT 06069. (203) 364-0063. (Feb '90) Chessmaster 2000 ‡‡‡‡

Chessmaster 2000 is a challenging chess program that can appeal to novices as well as experts. You can view the board from 2-D or 3-D perspectives and also turn it for a better look. Play is smooth and easy, and the program responds vocally. You may get tired of hearing "Gotcha," though. Version 1.0 reviewed. Version 1.02 shipping. Requires Mac Plus or later. \$44.95. Software Toolworks, 60 Leveroni Ct., Novato, CA 94949. (800) 231-3088 or (415) 883-3000. (July '87) Cribbage King/Gin King \$\$\$\$\$\$

Cribbage King/Gin King are excellent electronic versions of the card games. Both have seven skill levels and can challenge even the best players. Superb graphics but lack color support. Simple play

mechanics. Helpful tutorial. Excellent manuals offer strategic advice as well as game rules, Version 1.2 reviewed, Requires Mac Plus or later, \$39.95, Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. (800) 245-4525 or (415) 571-7171. (Sept

Crystal Quest ####

Crystal Quest combines all the good elements of nearly every video game ever made. Move a piece around to gobble up points and crystals. Shoot the nasties, and get through the goal before they get you. Excellent sound effects. In color on the Mac II. Version 2.2X shipping. Requires Mac Plus or later, \$49.95; with Critter Editor, \$79.95. Casady & Greene, Editor, 3/9.93, Casady & Greene, Inc., 22734 Portola Dr., Salinas, CA 93908. (800) 359-4920 or (408) 484-9228. (Apr '88) ★ '88

Dark Castle tttt

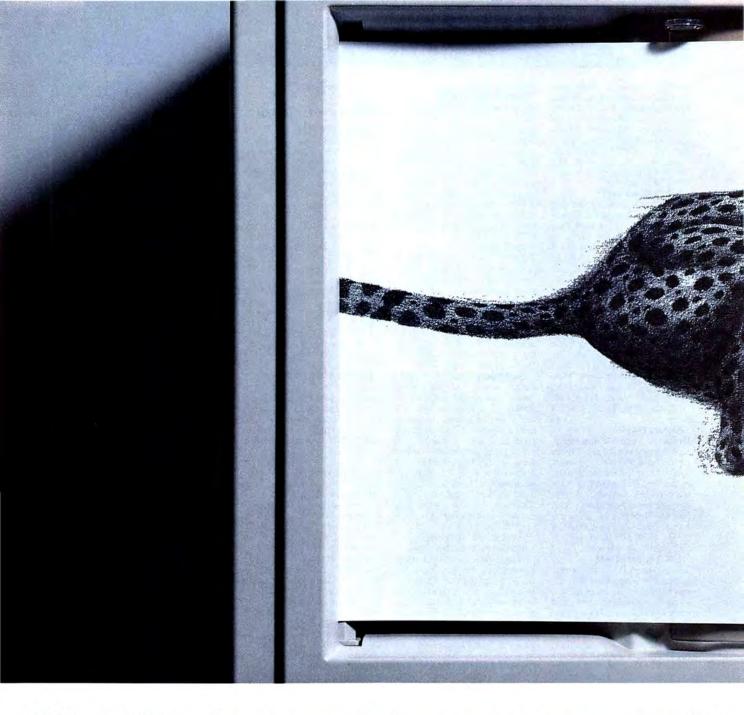
Dark Castle is an outstanding achievement in action games, integrating sound with superb animation and graphics. You need better-than-average hand/eye coordination, but it's worth the effort. Version 1.0 reviewed. Version 1.1 shipping. Requires Mac Plus or later, \$49.95. Aldus Corp., 411 First Ave. S., Seattle, WA 98104. (800) 333-2538 or (206) 628-2320. (Apr '87) ★ '87 Eddy Darwin's Dilemma \$\$\$\$\%

Darwin's Dilemma provides intriguing, deceptively simple entertainment. You manage a game piece called Darwin, which moves other icons to combine them within an invisible grid. These icons include genuine low life such as amoebas and paramecia, and your progress in managing recombinant life forms lets you graduate to jellyfish, octopuses, and crabs. A trick called teleswapping lets you accelerate the evolutionary process, and (if you're willing to lose points) you can undo a series of regrettable moves. Version 1.0.1 reviewed. \$49.95. Inline Design, 5 W. Mountain Rd., Sharon, CT 06069. (203) 364-0063. (Mar '91)

Falcon tttt/ Falcon simulates an F-16 fighter jet dogfighting with gut-tightening, sweat-making realism. Take on MiGs and dodge SAMs. Can be played via modern against other players. Version 1.0 reviewed. Version 2.2.1 shipping, Requires Mac Plus or later, \$59.95. Spectrum HoloByte, 2061 Challenger Dr., Alameda, CA 94501. (415) 522-3584 or (415) 522-0107.

(May '88) Ferrari Grand Prix tttt

Ferrari Grand Prix is an exciting racing-car simulation game. Mastering it takes a bit of time and effort. A beginners' course and four other courses are built in to the program. You can also design custom courses and backgrounds.



No other laser printer can outrun the

Dataproducts introduces the first 9 ppm animal of its kind with the powerful graphic capabilities of Adobe's PostScript* Level 2 software. And the LZR 960 is the first laser printer to combine Level 2 with a RISC-based controller for speed and agility. The LZR 960 delivers it all in one high performance package. The bottom line: you can print more complex pages in less time. And that's just for starters.

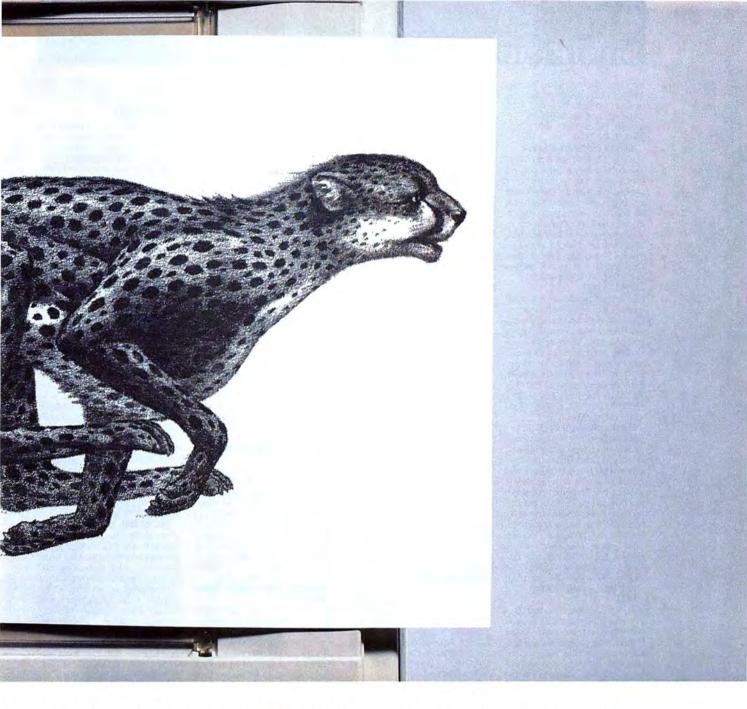
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Version 1.0 reviewed. Version 1.61 shipping. Requires Mac Plus or later. \$59.95. Bullseye Software, P.O. Box 7900, Incline Village, NV 89450. (702) 265-2298. (July '87)
Halls of Montezuma *****

Halls of Montezuma is a classic move-the-units war game adapted for the Mac. The scenarios cover famous U.S. Marine battles. Color and black-and-white versions for all scenarios, with good performance and play. You can create your own scenarios. Requires Mac Plus or later. \$44.95. Strategic Studies Group, Inc., 1747 Orleans Ct., Walnut Creek, CA 94598. (415) 932-3019. (Apr '90)

Ishido tttt Ishido is a flawless, sophisticated strategy game with a few twists. Comes in an expensive, very fancy woodbox. Programming is elegant and polished. Many options, including solitaire and multiuser modes. Requires Mac Plus or later. \$175; without wood box, \$54.95. Publishing International, P.O. Box 70790, Sunnyvale, CA 94086. (800) 535-2983 or (408) 738-4311. (May '90) Mission Starlight ‡‡‡‡

Mission Starlight is a throwback to Star Wars-type arcade games. It lets you swoop in low and fast, vaporizing foreign objects and lobbing missiles into the enemy power plant. This type of program has been around before, but this one is fast-paced, with responsive spaceship and intriguing graphics. Version 1.1 reviewed. Version 1.1.5 shipping, \$49.95. Casady & Greene, Inc., 22734 Portola Dr., Salinas, CA 93908. (800) 359-4920 or (408) 484-9228. (Oct '90)

NFL Pro League Football

NFL Pro League Football is a professional-football-league simulation that encourages people to play with people, not the machine. Fast action with lots of statistics. Includes three years of team statistics. Has modem capability and league-play mode. Version 1.0 shipping. Requires Mac Plus or later. \$79.95. Micro Sports, Inc., 1410 Mountain Ash Dr., Hixon, TN 37343. (800) 543-6735. (Apr '88)

Oids tttt

Oids is one of the finest Mac arcade-style games ever produced. Futuristic action based on your rescue of enslaved tiny Oids from hostile planets bristling with missiles and artillery. Limited to black-and-white or 16 colors. Lasting entertainment value. Version 1.0 reviewed, \$44.95. Software Heaven (FTL Games), 6160 Lusk Blvd., Ste. C206, San Diego, CA 92121. (619) 453-5711. (June '91)

Patton vs. Rommel tttt

Patton vs. Rommel is a strategic war game that covers battle events in Normandy during 1944. Although complex, it's well designed and very playable. \$19.95. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. (800) 245-4525 or (415) 571-7171. (Apr'87)

Pipe Dream tttt Pipe Dream is an addictive game that demands a nearly perfect mixture of strategy and speed. You must build a pipeline fast enough to prevent the stuff in the line from running out - that's it. It has 36 levels of play. Its copyprotection scheme requires you to use an included decoding wheel. Version 1.2 shipping. Requires Mac Plus or later. \$24.95. Lucasfilm Ltd., Games Division, P.O. Box 10307, San Rafael, CA 94912. (800) 782-7927 or (415)

721-3333. (May '90) PlayMaker Football ####

You won't find a better combination of football and computer game than PlayMaker Football. More of a coaching simulation than a play simulation, this game gives priority to strategic skills rather than animation - although the animation is reasonably good. Copy protection requires a master key disk. Version 1.0 reviewed. \$79.95. Brøderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903. (800) 521-6263 or (415) 492-3200. (May '91)

Shadowgate \$\$\$\$%

Shadowgate is an adventure game where you, as the seed of prophecy, must save the world from the evil warlock. Great animated graphics, sound, and adventure. Version 1.0 reviewed. \$49.95. Software Toolworks, 60 Leveroni Ct., Novato, CA 94949. (800) 231-3088 or (415) 883-3000. (Dec '87)

Shanghai tttt

Shanghai is a wonderful strategy game that has gorgeous color, good sound, and intelligence. It tells you when no more moves are possible. Version 2.0 reviewed. \$29.95. Activision (Mediagenic). 3885 Bohannon Dr., Menlo Park, CA 94025. (415) 329-0500. (Jun 90) * '86 Eddy

SimCity \$\$\$\$

SimCity is an animated game that's also a city-planning simulator. You can work on any one of eight scenarios included in the package. Evaluation window gives you instant feedback on your efforts. Optional Terrain Editor program lets you build cities from the ground up. Version 1.0 reviewed. Version 1.2 shipping. Requires Mac Plus or later. \$49.95; SimCity Supreme (color version includes Terrain Editor), \$79.95. Maxis Software, Two Theatre Square, Ste. 230, Orinda, CA 94563. (800) 336-2947 or (415) 254-9700. (June '89) ★ '89 Eddy

SimEarth ### 1/2 In SimEarth, you are the Supreme Being who guides an Earth-like planet's many species from evolution to civilization and finally to Exodus toward the distant galaxies before the Sun destroys it. Difficult to learn and has some bugs. Version 1.0 reviewed. Requires Mac Plus or later. \$69.95. Maxis Software, Two Theatre Square, Ste. 230, Orinda, CA 94563. (800) 336-2947 or (415) 254-9700. (July

Sky Shadow tttt

Sky Shadow is a must for anyone who appreciates fast action and has a sense of humor. It features a funky flying machine that kerchunks its way across a comic landscape. Not a game to play quietly; sound is everything in Sky Shadow. Version 1.02 reviewed. Version 1.0.9 shipping. \$49.95. Casady & Greene, Inc., 22734 Portola Dr., Salinas, CA 93908. (800) 359-4920 or (408) 484-9228, (Oct '90)

Space Quest stst Space Quest is a 3-D animated adventure in which you play a janitor in a dicey situation. The goal is to get off your ship before it explodes and save the Earnon System. Version 1.0 reviewed. Version 2.0 shipping, \$49.95. Sierra On-Line, Inc., P.O. Box 485, Coarsegold, CA 93614, (800) 326-6654 or (209) 683-4468. (Sept

Star Fleet I: The War Begins!

Star Fleet I: The War Begins! is a space opera of the Star Trek variety. Rise through the ranks from ensign to admiral in this serialized adventure. No color support in this old game; may not work reliably with newest Systems. Version 2.1 reviewed. Requires Mac Plus or SE, \$29.95. Interstel Corp., P.O. Box 57825, Webster, TX 77598. (713) 946-7676. (May '88)

Stratego: The Computer Game

The Mac version significantly improves on the classic Milton-Bradley board game in many ways. The object of the game is to capture your opponent's headquarters (symbolized by the enemy flag) before the enemy captures yours. Each side deploys an army of 32 officers (valued according to their rank), 1 spy, 6 bombs, and I flag. The Mac's presentation of Stratego closely resembles the board-game version's basic grid. The copyprotection scheme requires you to use a cardboard code wheel prior to play. Version 1.0 reviewed. \$49.95. Accolade, 550 S. Winchester Blvd., Ste. 200, San Jose, CA 95128. (800) 245-7744 or (408) 985-1700. (May '91)

Synchronicity \$\$\$\$ Synchronicity, based on the I Ching, can be used as a stressreduction or decision-making tool. Beautiful artwork and sounds. Even skeptics like it. Version 3.0 shipping. Requires Mac Plus or later; Mac II series or LC for color version. \$59.95; color version, \$79.95. Visionary Software, Inc., P.O. Box 69447, Portland, OR 97201, (800) 877-1832 or (503) 246-6200. (Mar '90)

Welltris \$\$\$\$1/2

Welltris is an arcade game that is a sequel to Tetris. Maneuver falling shapes in 3-D. Has musical accompaniment, options to preview shapes, and color or blackand-white versions. Not a DA. Copy-protected. Version 1.0 reviewed. Version 1.1 shipping. Requires Mac Plus or later, \$39.95. Spectrum HoloByte, 2061 Challenger Dr., Alameda, CA 94501. (415) 522-3584 or (415) 522-0107. (Oct '90)



BUSINESS

A4 111/2

A4 is based on 4th Dimension, the relational-database manager, and thus has 4D's power and drawbacks. It integrates general-ledger, accounts-payable, and accountsreceivable modules. Users who are familiar with 4D can customize it easily. Excellent multiuser capabilities. There's no payroll or last-in, first-out system, and it can be very slow. Version 2.0 shipping. Requires Mac LC or II series with at least 2 MB of RAM and 4th Dimension 2.0.1 or later. \$2,500. Softek Design, Inc., P.O. Box 2100, Telluride, CO 81435. (303) 728-5252. (May '90) Accountant, Inc. 1111

Accountant, Inc., offers a great deal of functionality, a high degree of conformance to the Mac interface, and solid accounting and bookkeeping fundamentals. Uses double-entry accounting. Compatible with AppleShare and MultiFinder. Version 1.01 reviewed. Version 2.1 shipping. Requires Mac Plus or later and a hard-disk drive. \$595. Softsync/ BLOC, 800 S.W. 37th Ave., Ste. 765, Coral Gables, FL 33134. (305) 445-0903. (Aug '90) ACCPAC Bedford Simply

Accounting tttt ACCPAC Bedford Simply Accounting has six ledgers and eight journals to handle the needs of small- to medium-sized businesses. Better Mac interface than most. Payroll-tax labels can't be modified, forcing you to subscribe to Bedford's yearly update service. Version 1.03 reviewed. Version 1.2 shipping. Requires Mac Plus or later with System 6.0.3 or later, \$199; updates \$100 per year or \$75 per year if begun at time of registration. Computer Associates International, Inc., 1240 McKay Dr., San Jose, CA 95131. (800) 531-5236 or (408) 432-1727. (Sept '88)

atOnce! \$\$\$\$% atOnce! is an integrated accounting package with general-ledger, accounts-payable, accounts-

receivable, and payroll modules. Primarily for small businesses. Features very good security, customizable reports, flexible fiscal calendar with 12 or 13 periods per fiscal year, and up to 26 open periods stored on-line. Version 1.0 reviewed. Version 1.2 shipping. Requires Mac Plus or later and a hard-disk drive. \$395. Peachtree Software, 1505 Pavilion Place, Norcross, GA 30093. (800) 247-3224 or (404) 564-5800. (Nov '89) ★ '89 Eddy Business Sense ### 1/2

Business Sense is a basic doubleentry accounting package with a one-write approach. It reports on two years' data. Has unusually strong data-importing and -exporting capabilities and payroll and budgeting features. Works on a single Mac only; tasks can't be divided among multiple machines. Version 1.3 reviewed. Version 1.41 shipping. Requires Mac Plus or later. \$179. Inman Software, P.O. Box 3240, Evanston, WY 82931.(307)789-7257.(May '90) CashLedger tttt

CashLedger employs cash-basis accounting rather than accrual accounting. Double-entry bookkeeping is supported transpar-ently. No transaction journals, credit limits, or finance-charge calculations. Version 1.3 re-viewed. Version 1.30 shipping. Requires Mac Plus or later. \$195; upgrade to MultiLedger, \$195. CheckMark Software, Inc., 1520 E. Mulberry, Ste. 200, Fort Collins, CO 80524. (800) 444-9922 or (303) 484-3541. (May '90) Components General Ledger

Components General Ledger is part of an integrated accounting series. Provides state-of-the-art flexibility, integrity, and functionality. Report generator may be strong enough to entice you to import data and use it with other accounting systems. Especially appealing to users with database or graphics backgrounds. Version 1.0 shipping. Requires Mac Plus or later with 2 MB of RAM, System 5.0 or later, and a hard-disk drive. General Ledger, \$595; Job Cost/Time Billing, \$995; Accounts Receivable, \$595; Accounts Payable, \$595. Satori Software, 2815 Second Ave., Ste. 295, Seattle, WA 98121. (206) 443-0765. (Oct '89)

Computerized Classic

Accounting \$\$\$\%
Computerized Classic Accounting is an Excel-based integrated accounting system. The spreadsheet interface is intuitive, working like traditional paper journals and ledgers. Supports custom reports, fully detailed audit trail, and password protection. Analysis can be done in Excel at any time. A good alternative for those currently using paper ledgers. Version 1.5 re-viewed. Version 2.2.2 shipping.

Requires Mac SE or later with at least 2 MB of RAM, Microsoft Excel 1.5 or later, and a hard-disk drive. Basic configuration, \$395; Client Write-Up version for accountants, \$695; enhanced version, \$995. Absolute Solutions, 3142 Vista Way, Ste. 400, Oceanside, CA 92056. (800) 633-7666, (800) 458-3399 (CA only), or (619) 966-8000. (Jan '90)

DacEasy Light Checkbook Accounting tttt

Using this well-done, functional system, for small-business and personal accounting, is like using acheckbook. After the initial setup of personal data, preferred forms, and passwords, you have available a full range of bookkeeping options, reports, invoices, and transaction analyses. Can handle multiple bank accounts and even credit-card purchases and balances. Version 2.0 reviewed. \$69.95. DacEasy, Inc., 17950 Preston Rd., #800, Dallas, TX 75252. (800) 877-8088 or (214) 248-0205. (May '91)

Flexware ttt Flexware is based on a proprietary language. This true multiuser accounting system must be professionally installed - it can't be used just off the shelf. Highly modular and extremely customizable. Basic modules cover all aspects of accounting. Can automatically pass data into Excel for further analysis. Two new modules, Request for Service and Sales & Lead Tracking, have been added. Version 6.02C reviewed. Version 6.9 shipping. Requires Mac Plus or later with a hard-disk drive and 2 MB of RAM, \$895 per module, except Order Processing and Purchasing, \$795 each; Point-of-Sale, \$695; Job Cost, \$995. Flexware, 150404 E. Valley Blvd., City of Industry, CA 91746. (800) 527-6587 or (818) 961-0237.

(May '90) Great Plains Accounting Series ttt

Great Plains Accounting Series consists of ten modules covering all aspects of accounting. Excellent and extensive documentation. Looks and feels like a mainframe accounting system and has outstanding functionality for serious users. Version 5.2 reviewed. Version 5.35 shipping. Requires Mac SE or later and a hard-disk drive. \$795 per module; except Import Manager, \$495; Executive Advisor, \$595; Job Cost, \$995; Network Manager, \$995 for 4 users. Great Plains Software, 1701 S.W. 38th St., Fargo, ND 58103. (800) 456-4417 or (701) 281-0550. (May '90)

Insight Expert Payroll #### Insight Expert Payroll is part of the Insight Expert series. Can be used as a stand-alone program but is best used with the other modules. Has an icon bar for quick access to all parts of the program. The large manual is excellent. It has special tax-law-updating capabilities - a major consideration in a payroll program. Requires Mac Plus or later, System 4.2 or later, and a hard-disk drive, \$695 (includes one free tax update). Peachtree Software, 1505 Pavilion Place, Norcross, GA 30093. (800) 247-3224 or (404) 564-5800. (Apr '90)

Insight Expert Series \$\$\$\$\% Insight is a high-powered accounting program for small- to medium-sized businesses. Modules include Accounts Receivable, Accounts Payable, General Ledger, Inventory Control, Time Billing, and Payroll. Version 1.0 reviewed. Requires Mac Plus or later, System 4.2 or later, and a hard-disk drive. \$695 per module. Peachtree Software, 1505 Pavilreachitee Software, 1505 Pavilion Place, Norcross, GA 30093. (800) 247-3224 or (404) 564-5800. (Dec '86) ★ '86 Eddy M.Y.O.B. ‡\$\$\frac{1}{2}\$\$\frac{1}{2}\$\$

Mind Your Own Business is an excellent value, functional enough for small-business accountants but accessible and intuitive enough for novices. It has integrated general-ledger, checkbook, accounts-receivable, accounts-payable, and inventory modules. There's no integrated payroll, and it lacks the ability to break out data by departments. The Card File feature maintains a simple contacts database, with the option of using a modem to auto-dial telephone numbers. Version 2.0 reviewed. Requires Mac Plus or later, System 6.0.3 or later, and a hard-disk drive. \$249. Teleware, Inc., 22 Hill Rd., Parsippany, NJ 07054. (800) 322-6962 or (201) 334-1154. (Apr '91) Multi-user Desktop

Accounting (MDA) \$\$\$\$

Multi-user Desktop Accounting is based on the Omnis 3 database program. It sets the standard for multiuser performance and accounting functionality in the offthe-shelf market. There are nine fully integrated modules and eight user-security classifications. Version 2.05 reviewed. Version 2.06 shipping. Requires Mac Plus or later with 2 MB of RAM recommended (4 MB for AppleShare server), and a hard-disk drive. Single-user version, \$1,795; up to 5 users, \$2,795; up to 10 users, \$3,795. Logisoft, Inc., 128 Villa Ct., Lafayette, CA 94549. (415) 939-3556. (May '90)

MultiLedger \$\$\$\$%

MultiLedger is an integrated general-ledger, accounts-receivable, accounts-payable, and inventory system. It does batch processing, handles multiple companies, tracks budgets, and has high-resolution-graphic statement printing. Double-entry bookkeeping is supported transparently. Lacks transaction journals and customer credit limits.

Version 1.3 reviewed. Requires Mac Plus or later. \$395. Check-Mark Software, Inc., 1520 E. Mulberry, Ste. 200, Fort Collins, CO 80524. (800) 444-9922 or (303) 484-3541. (May '90)

Payroll tttt

Payroll is a module designed to work with MultiLedger or CashLedger version 4.1. Version 4.10 shipping. Requires Mac Plus or later. \$295. CheckMark Software, Inc., 1520 E. Mulberry, Ste. 200, Fort Collins, CO 80524. (800) 444-9922 or (303) 484-3541. (May '90)

Plains & Simple 1111

Plains & Simple is an excellent one-write accounting system that offers full general-ledger, accounts-receivable, accounts-payable, and reporting modules. Has three-to-six-digit account numbers, 14 predefined account categories, a full audit trail, and multiple checking accounts. Provides more than 20 comprehensive reports and handles multiple companies. It defaults to accrualbasis accounting. Version 1.05 reviewed. Version 1.06 shipping. Requires Mac Plus or later (harddisk drive recommended), \$395. Great Plains Software, 1701 S.W. 38th St., Fargo, ND 58103. (800) 456-4417 or (701) 281-0550. (May '90) ★ '87 Eddy Rags to Riches ‡‡‡‡

Rags to Riches has been around since 1984 and is still excellent. There are separate general-ledger, accounts-receivable, accountspayable, inventory, and professional-billing modules. The program zooms in and recalls variable layers of data and has a "clairvoyant" search ability. Transactions automatically post through all relevant modules. There's no recurring-transaction ability. Version 1.0 reviewed. Version 3.11 shipping. Requires Mac 512Ke or later. \$199.95 per mod-ule; package of General Ledger, Accounts Payable, and Accounts Receivable, \$495. Chang Laboratories, Inc., 3350 Scott Blvd., Bldg. 25, Santa Clara, CA 95054. (408) 727-8096. (May '90)

Sales and Marketing Forecasting Toolkit \$\$\$\$%

The Sales and Marketing Forecasting Toolkit is an Excel-based productivity package. The 18 worksheets, 8 charts, and 1 macro sheet let you create graphs visually, and then the program shows you the numbers needed to substantiate it. This real-world approach works well. Version 2.0 reviewed. Requires Mac Plus or later and Microsoft Excel. \$149.95. Palo Alto Software, 260 Sheridan Ave., Ste. 219, Palo Alto, CA 94306. (800) 229-7526 or (415) 325-3190. (May '90)

SBT Database Accounting Library: Series Six Plus 1111 The multiuser SBT Database Accounting Library is based on

the FoxBase+ engine. Very fast. Has 16 integrated modules. Can support up to 99 companies with as many as 999 departments each. Three different types of budgets can be generated and tracked. Holds 24-month customer and 36month item histories. Requires Mac Plus or later. \$695 per module. SBT Corp. (Software Business Technology), One Harbor Dr., Sausalito, CA 94965. (415) 331-9900. (May '90) Service Industry Accounting

Service Industry Accounting is for small service and manufacturing firms. Has excellent security and good reporting abilities. Good use of Mac interface. Includes an inventory system and job costing for manufacturers. Version 5.38 reviewed. Version 5.73 shipping. Requires Mac Plus or later (harddisk drive recommended). \$395. Brown-Wagh Publishing, 130D Knowles Dr., Los Gatos, CA 95030. (800) 451-0900 or (408) 378-3838. (May '90)

TimeMinder \$\$\$\$ TimeMinder is an application for analysis and a DA for recording data. Each client's time slips are stored in separate files, which is a drawback. Batch entry is easy, however. The package's interface need polishing, and layout isn't WYSIWYG, making reporting unnecessarily difficult. Version 2.1.6 reviewed. Requires Mac Plus or later (hard-disk drive recommended). \$299. Aatrix Software, P.O. Box 5359, Grand Forks, ND 58206. (800) 426-0854 or (701) 746-6801. (Apr '90) Timeslips III ‡‡‡‡

Timeslips III is for professionals who bill by the hour. It works as a MultiFinder-compatible application for analysis and reporting and a DA for recording. Also comes as a DA for entering data. Batch entry is easy, and most descriptions can be customized. Features excellent documentation and online help, which compensates for the difficulty of learning the setup procedure. Timeslips can be useful, but some users may experience system incompatibilities. Version 2.0e reviewed. Version 2.0f shipping. Requires Mac Plus or later (hard-disk drive recommended). \$299.95; 5-user version. \$699.95. Timeslips Corp., 239 Western Ave., Essex, MA 01929. (800) 338-5314 or (508) 768-6100. (Feb '91) ★ '88 Eddy

WOS Fund Accounting \$\$\$ WOS Fund Accounting is a true multiuser system designed to meet the unique needs of government and nonprofit agencies. Contains general-ledger, payroll, purchaseorder/voucher, and accountsreceivable modules. Can handle multiple-fund accounting and multiple-year adjustments. Meets most federal reporting require-ments. Requires Mac Plus or later.

\$4,995. Farallon Computing (Kansas office), 1321 Wakarusa Dr., Ste. 2010, Lawrence, KS 66049. (800) 843-8101 or (913) 843-8101. (May '90)

PERSONAL

CheckFree \$\$\$1/2

CheckFree is electronic-bill-paying software that works with a dedicated service. Bills are paid by draft or by electronic-to-check method. Users have no way of knowing which method the service will use for a particular payment, so a minimum of four days' notice is required on all payments. Software works well but does have problems with MultiFinder. Version 1.5 reviewed. Requires Mac 512Ke or later, System 4.1 or later, and Hayes-compatible modem (hard-disk drive recommended). \$33.95; service costs \$9.95 per month for up to 20 payments, month for up to 20 payments, \$3.50 for each additional 10 payments. Checkfree Corp., 720 Greencrest Dr., Westerville, OH 43081. (800) 882-5280 or (614) 899-7500. (Aug '90)
Checkwriter | 1 111

Checkwriter II is a personalaccounting package that uses your checkbook like a ledger. This version offers good functionality at a reasonable price. New features include an overbudget warning that prevents overspending in a specific category, a transfer command that shifts funds between accounts, an address database, drawing tools for designing checks, a Quicken file converter, good reporting options, and an updating function for recurring transactions. Print checks on laser printers or ImageWriters. Version 3.1 reviewed. \$59. Aatrix Software, P.O. Box 5359, Grand Forks, ND 58206. (800) 426-0854 or (701) 746-6801. (Apr '91)

MacInTax 1990 #### MacInTax is an excellent tool for preparing federal and some state tax forms. Intuitive and easy to use (with all separate forms automatically interlinked for accurate recalculation), it's consistently the best in its class. Accepts data from the leading personal-finance programs. Good built-in help. Prints IRS-accepted forms on all Laser-Writers and ImageWriters. Many state-tax-form sets are also available. Version 1.4 reviewed. Requires Mac Plus or later, Federal, \$99; state, \$69 each. SoftView. Inc., 1721 Pacific Ave., Ste.100, Oxnard, CA 93033. (805) 385-5000. (Apr '91) * '86, '89 Eddy

MacMoney ttt MacMoney is a full-featured financial manager that produces a wide and useful variety of reports and graphs. Version 3.1 reviewed. Version 3.5 shipping. Requires Mac 512K or later. \$119.95. Survivor Software Ltd., 11222 La Cienega Blvd., Ste. 450, Inglewood, CA 90304. (213) 338-0155. (July '88) * '86 Eddy

Managing Your Money tttt// Managing Your Money is Andrew Tobias' respected and well-supported personal-financial-manager program. Long list of features. It can print checks and keep detailed accounts. An excellent choice for users with moderately complex finances. Version 2.0 reviewed. Version 4.0 shipping. Requires Mac Plus or later, System 6.0.3 or later, and a hard-disk drive. \$119. Meca Software, Inc., P.O. Box 907, Westport, CT 06881. (203) 222-9150. (Apr '90)

Quicken \$\$\$\$\$ Quicken is the best tool for home budgets, cash-flow management, and tax-record keeping. Mimics your checkbook, so tracking your finances is easy and intuitive. Provides detailed reports supporting tax deductions and sources of income for Schedules A, B, C, D, and E; Forms 1040 and 2106; and Canadian tax forms. Version 1.0 reviewed. Version 1.5 ship-ping. Requires Mac 512Ke or later. \$59.95. Intuit, Inc., P.O. Box 3014, Menlo Park, CA 94026. (800) 624-8742 or (415) 322-0573. (Dec '89) * '88 Eddy

TurboTax for the Macintosh

TurboTax is an excellent tool for preparing federal and certain state tax forms, but this first Mac incarnation hasn't outgrown its PC origins. It makes extensive use of intermediate worksheets instead of accepting data directly into its tax forms. Separate forms and fields can be interlinked for automatic recalculation. Accepts data from the leading personalfinance programs. Excellent builtin help. Prints IRS forms on LaserWriters and ImageWriters. Many state-tax-form sets are also available. Version 1.0 reviewed. \$89; state-form packages, \$49 each. Chipsoft, Inc., P.O. Box 85709, San Diego, CA 92186. (800) 755-8829 or (619) 587-3939. (Apr '91)

Wall Street Investor tttt

Wall Street Investor (formerly Market Pro) helps spot stockmarket trends, using technical analysis. Downloads information from an electronic service. Good charting. Version 2.1 reviewed, Version 3.02 shipping. Requires Mac Plus or later and a hard-disk drive; telecommunications use requires a Hayes-compatible modem and an I.P. Sharp or Track Data account. \$695. Pro Plus Software, Inc., 919 N. Stapley Dr., Ste.N, Mesa, AZ85203.(800) 227-5728 or (602) 461-3296. (Oct '88)

FREEWARE & SHAREWARE

ASCII Chart DA ttt/2

ASCII Chart DA shows all 256 characters for a font. Fonts can be easily changed with the Font

menu. Can display characters at 72 points. Quickly finds hidden characters, keystrokes, and hex equivalents. Doesn't print. Version 3.2 shipping. Free on many BBSs and on-line services. Jon Wind. (Oct '90)

Blesser \$\$\$1/2

Blesser allows you to switch between various System Folder configurations on your hard disk without conflicts during startup. Prevents access to the Set Startup defaults for MultiFinder when you're restarting a switched-on system. Version 1.1 shipping. Free. Dave McGary. (Oct '90)

Color Bits \$\$\$\$ Compared with previous generations of icon-drawing utilities, Color Bits is a dream come true. It's still not the ultimate iconmanufacturing machine, but it lets you quickly draw a new icon or add color or revisions to an existing one. And it doesn't require ResEdit. Available on some BBS and on-line services. Version 1.0 shipping. Shareware, \$10. Ben Haller. (Oct '90)

Dir-Acta-Ry \$\$\$\$ Dir-Acta-Ry gives you an overview of the contents of a directory. Takes a picture of files and folders on your main disk to store in outline form. You can read files with any of the Acta DAs/applications or with other outlining programs. Features an impressive array of display and directory view

options. Free. David Dunham.

(Oct '90)

Klondike tttt Klondike is a version of solitaire that uses video-game-like scoring to create a superb, totally addictive game. Simple to play -- nearly impossible to stop playing. Version 3.3 reviewed. Version 4.0 shipping. Shareware, \$10. Unison Software, Inc., 675 Almanor Ave., Sunnyvale, CA 94086. (408) 245-3000. (Dec '87)

MIDI Companion \$\$\$\$% MIDI Companion is a MIDI tool that lets you patch MIDI signals, sounds, and channels through the DA and separate sounds for singlechannel playback. Has extensive electronic documentation. Requires knowledge about using the Mac with MIDI. Version 1.0 shipping. Shareware fee, \$15. Robert Patterson. (Oct '90)

miniWriter tttt miniWriter is a word-processing DA that has a slick feel and is easy to use. Features include curly (smart) quotes, a Find function that works well, and the option to set the typeface and size for the whole document but not for individual words. Designed for dotmatrix printers, it prints very well on laser and inkjet printers too. Version 1.6 reviewed. Version 1.61 shipping. Shareware, \$12. Maitreya Design, P.O. Box 1480, Goleta, CA 93116. (805) 968-7578. (Oct '90)

MugShot tttt

MugShot analyzes and informs you about your Mac's hardware and operating system. Besides hardware data, MugShot lists all installed DAs, INITs, control panels, and RDEVs. This data can be vital if you experience conflicts or problems. Version 1.21 shipping. Free from on-line services or \$5 from author. Mi Concepts, P.O. Box 8822, Kentwood, MI 49508. (Sept '89)

Sound Manager Package

1111/2

Sound Manager Package is a group of well-implemented sound-file manipulators and players. It's the best, most versatile utility set available for sound (as opposed to music) aficionados. Many useful and amusing sounds are included on-disk. Version 1.40 shipping. Requires Mac 512Ke or later. Shareware, \$20. Ettore Software, 67 Rue de la Limite, 1970 W-Oppem, Belgium. (011) 322-235-5978. (Nov '89)

SoundMaster ####

SoundMaster is an elegant INIT/ control panel that lets you assign sounds to a wide range of actions, including startup, shut down, disk insertion or ejection, and assorted key presses. Keeps track of the amount of memory consumed by sounds. Version 1.6.5 shipping. Requires System 4.1 or later. \$20. Bruce Tomlin, 15801 Chase Hill Blvd., Ste. 109, San Antonio, TX 78256. (Nov '89) SuperClock! **‡‡‡‡**

SuperClock! is a superb on-screen time indicator or clock. Is able to work properly in every environment and also has excellent timer and alarm functions. Version 3.9 shipping. Requires System 4.1 or later. Free. Steve Christensen, CompuServe 76174,1712; Apple-Link STEVEC. (Nov '89)



Capture \$\$\$\$%

Capture is a reliable screen-capture utility. It can capture full or partial screens either to the Clipboard or to a PICT file. Supports 8-bit and 32-bit color. Capture may have to be renamed on your Mac to avoid INIT conflicts. Version 2.0 reviewed. Version 4.0 shipping. Requires System 6.0.3 or later. \$129.95. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. (818) 991-6540. (Jan '90)

ColorStudio tttt/2

Although decidedly more complex and difficult to learn than Adobe's Photoshop, ColorStudio offers an unbeatable set of tools for professional-quality color manipulation and high-end output. For electronic prepress work where scanned photos, computergenerated graphics, or other art-work must look their best, ColorStudio lets you control color

calibration, film separations, amazing special effects, and a wide range of image-editing tools. The Shapes Annex package (now bundled with ColorStudio) adds an editable PostScript drawing layer. Version 1.11 reviewed. \$995. Letraset USA, Inc., 40 Eisenhower Dr., Paramus, NJ 07653. (800) 343-8973 or (201) 845-6100. (May '91) ★ '90 Eddy

Digital Darkroom tttt If you don't need the color capabilities of more-expensive photomanipulation programs, then Digital Darkroom is for you. Strictly for black-and-white or high-resolution gray-scale images, this program does everything required for professional photo layouts. Uncluttered interface and a wide variety of painting and selection tools. Can colorize images. Version 2.0 reviewed. Requires Mac Plus or later with at least 4 MB of RAM and a harddisk drive or SE/30 or II series with gray-scale- or color-video card and monitor required for grayscale viewing. \$395. Aldus Corp., 411 First Ave. S., Seattle, WA 98104. (800) 333-2538 or (206) 628-2320. (June '91) ★ '88 Eddy

Enhance \$\$\$\$\%

Enhance is an 8-bit, gray-scale image processor. Has many of the graphics tools of a first-class photo-retouching program. Blends image processing with high-level graphic-arts tools. Has painting, text, and shape-drawing tools. Weak manual. Version 1.01 shipping. \$375. MicroFrontier, 7650 Hickman Rd., Des Moines. IA 50322. (800) 388-8109 or (515) 270-8109. (July '90)

Flexigraphs tttt

Flexigraphs lets you start with basic charts that you can modify in a staggering variety of ways. The simple but elegant interface lets you add attractive details and modify certain parts of charts while locking other areas down. Version 1.5 shipping. Requires Mac Plus or later. \$149. Tree Star, Inc., 116 Memory Ln., Campbell, CA 95008. (800) 366-6045 or

Image Analyst is an image-processing program that lets you identify and analyze any element of an image. No programming is necessary. Measurements and statistics can be automatically or interactively generated from TIFF or PICT files or from captured video images. Manual is well illustrated but poorly written. Easy to learn. Version 7.1 shipping. \$2,000. Automatix, 1000 Tech Park Dr., Billerica, MA 01821. (508) 667-7900. (July '90)

Image Grabber \$\$\$\$\%

Image Grabber is a DA screencapture program. Can capture pulldown menus and convert 8- and 24-bit-color screens to 2-bit blackand-white files, saving huge

amounts of memory. It has realtime and delay modes and captures in the MacPaint and PICT formats. Version 2.0 reviewed. Requires Mac Plus or later and System 6.0.3 or later, \$90. Sabastian Software, P.O. Box 70278, Bellevue, WA 98007. (206) 861-0602. (May '90)

ImageStudio tttt/2

ImageStudio puts a complete black-and-white or gray-scale photo-retouching lab onto the Mac desktop. Editable brushes let you modify digitized images in 256 gray levels. If you never work on color images, ImageStudio is all you need for professional photo manipulation. Version 1.0 reviewed. Version 1.7 shipping. Requires Mac Plus or later and a hard-disk drive; gray-scale work requires 8-bit-video card and a compatible monitor. \$250. Letraset USA, Inc., 40 Eisenhower Dr., Paramus, NJ 07653. (800) 343-8973 or (201) 845-6100, (June '88)

LANDesign \$\$\$\$\%

LANDesign is a versatile landsurveying program that simulates the way surveyors worked before they had Mac software. All standard coordinate geometry features are supported, and all objects can be named with character identifiers and labels. This intelligent program is easy to use. Version 1.11 reviewed. Version 1.14 shipping. Requires Mac Plus or later (hard-disk drive recommended). \$595. Compuneering, Inc., 113 McCabe Crescent, Thornhill, Ontario L4J 2S6, Canada. (416)

MultiClip 2.0 is a much improved version of an already good product. It lets you have as many Clipboards as your hard-disk space allows, making many graphics and page-layout applications easier to use. The new features make it easier to find an image quickly. Version 2.0 reviewed. Requires Mac Plus or later, \$129, Olduvai Corp., 7520 Red Rd., Ste. A, South Miami, FL 33143, (800) 822-0772 or (305) 665-4665, (Oct '90)

PhotoMac \$\$\$\$

PhotoMac is a color-retouching tool for PICT and TIFF photographs. Displays and edits in 8-bit mode; saves in 8- or 24-bit modes. Performs color separations, but process requires substantial disk space. Version 1.0 reviewed. Version 1.5 shipping. Requires Mac II with 2 MB of RAM, a color monitor, an 8-bit-videocard, 32-bit QuickDraw, and a hard-disk drive. \$795. Data Transla-tion, 100 Locke Dr., Marlboro, MA 01752. (508) 481-3700. (July '89) * '88 Eddy

Photoshop tttt

Photoshop is a 32-bit photoretouching program combining powerful image-editing capabilities with an unintimidating inter-

face. Easy to use. Flexible fileconversion options - can import and export images to and from popular graphics file formats for Mac and DOS machines. Has 22 pictorial options and 5 third-party filters. Version 1.0 shipping. Requires Mac II series, 2 MB of RAM, a hard-disk drive, and a color monitor, \$895. Adobe Systems, 1585 Charleston Rd., P.O. Box 7900, Mountain View, CA 94039. (800) 344-8335 or (415) 961-4400. (Oct '90) ★ '90 Eddy

PictureBook ####

PictureBook is a superb Scrapbook replacement. It catalogs your Scrapbook and lets you resize and/ or crop anything that can be copied to the Clipboard. Powerful and has an excellent interface. Version 3.1 reviewed. Version 3.2a shipping. Requires Mac Plus or later and System 4.1 or later (hard-disk drive recommended). \$99.95. Loop Software, P.O. Box 1249, 704 University Dr., Menlo Park, CA 94025, (800) 288-7631 or (415) 326-4803. (Sept '89)

Screenshot \$\$\$\$\$

Screenshot is a simple, powerful screen-capture utility. It can precisely capture and save selected screen items, without extraneous pixels surrounding the captured image. You can convert color images to black-and-white on the fly and can change the image size at the time of capture. You can leave the Screenshot window open to capture multiple images without repeatedly pressing the "hot key." Images can be printed or saved immediately in bit-mapped paint, PICT, 24-bit color, Clipboard or Scrapbook, or Startup-Screen formats. Version 1.1 reviewed. \$59.95. Baseline Publishing, 1770 Moriah Woods Blvd., Ste. 14, Memphis, TN 38117. (800) 926-9676 or (901) 682-9676. (Mar '91)

Smart Art \$\$\$\$\$

Smart Art is a nifty PostScript utility disguised as a DA. It creates special effects with text and graphics and lets you import EPS files into any program. Has 15 text effects. Version 1.0.1 shipping. Requires Mac Plus or later, System 6.0.3 or later, and a PostScript laser printer. \$149. Adobe Systems, 1585 Charleston Rd., P.O. Box 7900, Mountain View, CA 94039. (800) 344-8335 or (415) 961-4400. (Oct '89)

Smart Art II, III, and IV tttt Smart Art II, III and IV are the second, third, and fourth volumes of Smart Art. Each volume includes an export facility and a much-improved DA that permits direct printing. Volume II includes graphic elements; volumes III and IV contain text effects. Version 1.0.2 shipping. Requires Mac Plus or later, System 6.0.3 or later, and PostScript laser printer. \$149 per volume. Adobe Systems, 1585 Charleston Rd., P.O. Box 7900,

MiniFinders

Mountain View, CA 94039. (800) 344-8335 or (415) 961-4400. (Jan

SmartScrap and The Clipper

SmartScrap and The Clipper are two useful DA utilities for graphics work. SmartScrap is a major enhancement to the standard Scrapbook DA. The Clipper provides a transparent Clipboard window that lets you resize or crop a graphic to the area in which it will be pasted. Version 2.01 shipping. Requires Mac Plus or later and System 6.0.3 or later. \$89.95. Solutions, Inc., P.O. Box 783, Williston, VT 05495. (802) 865-9220. (July '87) * '87 Eddy

SnapJot \$55%
SnapJot is a DA/INIT utility that lets you capture full or partial screens. Differs from similar products in that the captured window remains on-screen within a real window, which you can use as you work. All or part of a screen, window, dialog box, or menu can be captured as a color or a blackand-white image. Supports PICT or paint formats. There is no way to scale or crop captured images or to save them as startup screens, but these features are available in other painting applications. Version 3.0 reviewed, \$59.95. Wildflower Software, 21W171 Coronet Rd., Lombard, IL 60148. (708) 916-9360. (June '91)

Streamline \$\$\$1/2 Streamline is a dedicated Post-Script auto-trace package. Can quickly produce nearly print-ready traces with little tweaking. Retains original scanned images' black-and-white values. Final touch-ups must be completed in Illustrator or a similar program. Continuous-tone photos aren't worth the trouble. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later and System 4.2 or later (2 MB of RAM recommended). \$195. Adobe Systems, 1585 Charleston Rd.. P.O. Box 7900, Mountain View, CA 94039. (800) 344-8335 or (415) 961-4400. (Nov '89)

Virtus WalkThrough #### Virtus WalkThrough is a powerful modeling and visualization package that makes virtual reality available to ordinary desktop Macs. Provides two views of an imaginary building or other object: 2-D Design, which lets you create and precisely customize a model, and 3-D Walk View, which offers a real-time, rendered color perspective through which you navigate in any direction. Lacks import/export capabilities needed for serious CAD. Compact data files. Version 1.0.3 reviewed. Requires Mac Plus or later with 2 MB of RAM (hard-disk drive recommended). \$895. Virtus Corp., 117 Edinburgh S., Ste. 204, Cary, NC 27511. (919) 467-9700. (July '91) * '90 Eddy

CAD

Aperture ttt/2

Aperture combines a CAD program with a database manager. Some of its numerous features are difficult to access, but generally the package is very useful. The database application is a decent flat-file manager, and the drawing portion of the package has color support, infinite zoom, and libraries as well as many other power tools. Version 1.0.2 reviewed. Version 1.6 shipping. Requires Mac Plus or later (Mac SE/30 or II series with 2 MB of RAM recommended). \$795. Aperture Technologies, Inc., 84 W. Park Place, Stamford, CT 06901. (800) 342-9022 or (203) 975-7587. (Apr '90) Ashlar Vellum \$\$\$\$%

Vellum is an entirely new type of CAD package with AI elements. The cursor can inform you about its exact position (midpoint, end, and so on). The program's full set of tools includes a library of resizable parametric shapes. Performance is good if you have a fast Mac and lots of RAM (at least 4 megabytes). Can import and export DXF files but not IGES files. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac II series or SE/30 with 2 MB of RAM (4 MB recommended). \$995. Ashlar, Inc., 1290 Oakmead Pkwy., Ste. 218, Sunnyvale, CA 94086. (408) 746-1800. (May '90) * '89 Eddy

Blueprint \$\$\$\$

Blueprint is a 2-D CAD program with features that, as the name implies, are particularly useful for architectural drafting. Its control over colors and patterns is excellent. Version 1.0V6 reviewed. Version 2.0 shipping. Requires Mac Plus or later, \$295. Graphsoft, Inc., 8370 Court Ave., Ste. 202, Ellicott City, MD 21043. (301) 461-9488. (July '90) Claris CAD \$\$\$\$\$

Claris CAD is an excellent choice for entry- or midlevel 2-D mechanical drafting. It's easy to master if you are proficient with MacDraw II. The most important new addition is a guide to location and construction of geometric features. It lacks an integrated spelling checker and offers only limited color support. There are special tools for architects, and mechanical engineers should like the well-implemented, ANSIstandard Geometric Dimensioning and Tolerancing system. Version 2.0 reviewed. Requires 2 MB of RAM, \$899; Claris Graphics Translator, \$299. Claris Corp., 5201 Patrick Henry Dr., Santa Clara, CA 95052. (800) 544-8554 or (408) 727-8227. (Mar '91)

Design Your Own Home: Architecture \$\$\$1/2

Design Your Own Home: Architecture is a specialized drawing

program that produces simple housing floor plans and elevations. Its built-in parts libraries and many sample plans (that come from four separately available libraries) make the job easy. It's a decent drawing program. Version 2.6 shipping. Requires Mac Plus or later. \$99.95; additional design libraries, \$29.95 each. Abracadata Ltd., P.O. Box 2440, Eugene, OR 97402. (800) 451-4871 or (503) 342-3030. (May '90)

DynaPerspective ####

Presentation was the strength in earlier versions of this 3-D CAD program. Necessary drafting capabilities have now been added, its rendering tweaked, and its animations made faster and smaller. You can use up to 16 drafting layers. DynaPerspective's limitation is its method for measuring relative distances. It is a powerful, versatile tool and a great value. Version 2.01 reviewed. Version 2.02 shipping. Requires Mac II series with at least 2 MB of RAM and 8- or 24-bit-video card (harddisk drive recommended), \$995. Dynaware USA, Inc., 950 Tower Ln., Ste. 1150, Foster City, CA 94404. (800) 445-3962 or (415) 349-5700. (Dec '90) * '90 Eddy

MiniCad+ 3.0 \$\$\$\$\% With a fast and logical interface, MiniCAD+ has a Pascal-like macro language, an internal database. 2-D as well as 3-D graphics, a linked spreadsheet, and a low price. Has a MacDraw-like feel, but it may have the best 3-D capabilities among low-cost CAD programs. Good documentation. Graphsoft's tech support is helpful. A HyperCard tutorial stack is sold separately. Version 3.0 reviewed. Requires Mac Plus or later with 2 MB of RAM, System 6.0, and a hard-disk drive. \$795. Graphsoft, Inc., 8370 Court Ave., Ste. 202, Ellicott City, MD 21043. (301) 461-9488. (Apr '91) ★ '90 Eddy

ModelShop \$\$\$%

ModelShop is a powerful 3-Dmodeling package. It needs many navigational and editing improvements to match its powerful feature set, however. Procedures not only differ from what you expect but often require too many steps. Version 1.1 shipping. Requires Mac Plus or later and a hard-disk drive, \$595, Paracomp, Inc., 1725 Montgomery St., San Francisco, CA 94111. (415) 956-4091. (Apr '90) StrataVISION 3d \$\$\$\$

StrataVISION 3d brings mainframe rendering power to the Mac but you need a lot of RAM and a lot of patience. It's a modeling and visualization tool that can create photo-realistic 3-D images. Rendering can take hours, but it can also be done in the background so you can do other work. Conspicuously lacks precision options. Five libraries are available. Version 1.4.2 shipping, Requires Mac II series with FPU and hard disk and at least 2 MB of RAM. \$495; libraries, \$139 each, Strata, Inc., 2 W. St. George Blvd., Ancestor Sq., Ste. 2100, St. George, UT 84770. (800) 678-7282 or (801) 628-5218. (May '90)

VersaCad tttt

VersaCad is a powerful CAD program that doesn't show any of its DOS roots. Excellent element manipulation and full plotter support. Library user interface is crude. Version 1.0 reviewed. Version 3.0 shipping. Requires Mac Plus or later. \$2,395. Computervision (Personal CAD/CAM Business Unit), 100 Crosby Dr., Bedford, MA 01730. (800) 488-7228 or (617) 275-1800. (July '88) * '88 Eddy

CLIP ART

650 Megabyte Clip-Art Disk

The 650 Megabyte Clip-Art Disk is a CD-ROM containing 182 scanned TIFF images and 886 mostly color EPS files in the Adobe Illustrator 88 format, EPS graphics are of amateur quality; TIFF files are more useful. The quality of the scans is adequate, but many of the images are marred by washed-out colors or are too dark to be useful. Requires Mac Plus or later and CD-ROM drive. \$499.95. Media Clip-Art, 1879 Old Cuthbert Rd., Unit #10, Cherry Hill, NJ 08003. (609) 795-5993. (Sept '90)

Artbeats 1111

Artbeats is a series of superb, hightech EPS backgrounds. Five packages (Dimensions 1 and 2, Potpourri, and Natural Images 1 and 2) offer abstract, geometric, and natural images. Each package has 20 full-page, complex backgrounds, saved as both FreeHand and EPS files, often with sophisticated blends that demand RAM and take time to print (the results are worth it). Requires Mac Plus or later with 2 MB of RAM (harddisk drive recommended). Dimensions 1, \$79.95; Dimensions 2, \$99.95; Potpourri, \$99.95; Natural Images 1, \$99.95; Natural Images 2, \$129.95. Artbeats, P.O. Box 20083, San Bernardino, CA 92406. (714) 881-1200. (Nov '90)

Canned Art: Clip Art for the Mac tttt/2

Canned Art: Clip Art for the Mac is a printed catalog of more than 15,000 images available on-disk. Most images are reduced, so several fit on a page. Includes an excellent detailed index, saving you from hunting through disks. \$29.95; sample disk, \$10. PeachPit Press, 1085 Keith Ave., Berkeley, CA 94708. (800) 283-9444 or (415) 527-8555. (Sept '90)

Click & Clip ttt

The Click & Clip packages are graphics with seasonal themes.

Of the two quarterly editions released as of August 1988, the spring 1988 package is the better one. Version 1.0 reviewed. Requires a program that reads EPS files, and a PostScript printer. Quarterly editions, vol. 1–10, \$39.95; C&C 500, \$395; C&C Military Art v1.1, Medical/Health v1.3, and Business v1.5, \$149 each; Road and Warning Signs v1.2 and International Symbols v1.6, \$99 each; Borders v2.8, \$79; Christmas v2.2 and Seasonal v2.2, \$19.95 each. Studio Advertising Art. P.O. Box 43912, Las Vegas, NV 89116. (702) 641-7041. (Aug '88) ClickArt \$\$\$\$

The ClickArt series consists of numerous MacPaint and EPS packages. Themes include business, sports, animals and nature, holidays, religion, and cartoons. Artwork is generally well drawn; some collections are a bit unfocused, but overall this is a good buy. MacPaint-format packages include useful ClipOut DA and a HyperCard stack. Requires graphics application for MacPaintformat or PostScript images. MacPaint packages, \$49.95 each; EPS packages, \$129.95 each. T/Maker, 1390 Villa St., Mountain View, CA 94041. (415) 962-0195. (Nov '90)

Clipables 1111 Clipables is an enormous collection of EPS artwork. The 600 images - 10 megabytes of data are well drawn and cover a wide range of topics. A broad but shallow package. \$149.95. C.A.R., 7009 Kingsbury, St. Louis, MO 63130. (314) 721-6305. (Mar '87)

Cliptures ttt

The Cliptures series of EPS clipart includes two packages of business images and one sports collection. Volume 2, Business Images 2, is the best collection and can be cataloged with Curator. Version 1.0 reviewed. \$129.95. Dream Maker Software, 7217 Foothill Blvd., Tujunga, CA 91042. (800) 876-5665 or (818) 353-2297. (Aug '89) Collector's Edition I and II

The Adobe Collector's Edition offers excellent selections of basic graphic elements for Illustrator users. Symbols, Borders & Letterforms contains a wide range of dingbats, borders, and two editable alphabets. Patterns and Textures provides more than 400 patterned fills, including standard patterns used in architecture, mapmaking, meteorology, and geology. Files are Illustrator documents and must be resaved in EPS format before being imported into other programs. Requires Adobe Illustrator, Symbols, Borders & Letterforms, \$125; Patterns and Textures, \$225. Adobe Sys-tems, 1585 Charleston Rd., P.O.

Box 7900, Mountain View, CA 94039. (800) 344-8335 or (415)

94039. (800) 344-8333 of (413) 961-4400. (Nov '90) Comic People, Volume 2: Kid Stuff \$\frac{444}{24}\$ Comic People, Volume 2: Kid Stuff is a set of Comic Strip Factory add-ons, drawn by Trici Venola and Kurt Wahlner. Extraordinary quality and range. Kid Stuff presents five children and two grown-ups of both sexes and various ethnic backgrounds. Also included are backgrounds, sound effects, a very spry cat, and some Little Extras. Best used from within Comic Strip Factory. Requires Mac Plus or later. \$39.95. Foundation Publishing, Inc., 14228 Shore Ln., Prior Lake, MN 55372,(612)445-8860.(Aug '90)

Digit-Art 111 Digit-Art is an overwhelming collection of EPS clip art that's available on floppy disk and on CD-ROM. Comes with a welldesigned catalog of images. Twenty volumes are available. Version 1.0 reviewed, Version 5.0 shipping. Requires a program that reads EPS files. CD-ROM, \$799; single volume (disk), \$99; two volumes (disk), \$149; three volumes (disk), \$198. Image Club Graphics, Inc., 1902 Eleventh St. S.E., Ste. 5, Calgary, Alberta T2G 3G2, Canada. (800) 661-9410 or (403) 262-8008. (Aug '88)

Graphics Pak \$\$\$\$ The ArtWare Graphics Pak is a large collection of clip art with uneven quality. The borders are

the most elegant. Other packages are available. Version 1.0 shipping. Requires a program that reads EPS files and a PostScript printer. \$149.95. ArtWare Sys-tems, Inc., 6512 Six Forks Rd.,

Ste. 502A, Raleigh, NC 27615. (800) 722-3764 or (919) 870-

9593. (Aug '88) Images with Impact! **\$\$\$\$**\$ Images with Impact! has three collections of superb, imaginative EPS clip art. The Business package contains 175 images of people, equipment, and office scenes. Graphics & Symbols covers several topics and drawing styles. Accents & Borders (winner of an Eddy Award) contains 270 design elements, including borders, frames, ornaments, symbols, and mortises; registered users receive a bonus disk of color artwork. Images are opaque, and most are strategically subgrouped for easy editing. Excellent manual. Business package, \$129.95; Graphics & Symbols, \$99.95; Accents & Borders, \$129.95. 3G Graphics, 11410 N.E. 124th St., Ste. 6155, Kirkland, WA 98034. (800) 456-0234 or (206) 367-9321. (Nov '90) ★ '90 Eddy

Japanese Clip Art \$\$\$\$% Japanese Clip Art is extraordi-nary. Consists of MacPaint documents and separate fonts. Volume I, Heaven, covers mythological

subjects; Volume II. Earth, offers secular subject matter. Version 1.0 reviewed. Each volume, \$79.95; Year of the Dragon '88, \$29.95. Qualitas Trading Co., 6907 Norfolk Rd., Berkeley, CA 94705. (415) 848-8080. (Apr '87)

MacGallery \$\$\$\$

MacGallery is a whimsical col-lection of MacPaint images, ideal for children's publications, newsletters, fliers, and invitations. The 400 original illustrations include holidays, food, sports, borders, animals, plants, babies, teddy bears, dinosaurs, and cartoon arms and legs for enhancing other images. Four pieces of presized stationery in greeting-card, three-fold mailer, business-card, and certificate sizes. Excellent manual. Requires Mac Plus or later and graphics program compatible with MacPaint-format files. \$49.95. Dream Maker Software, 7217 Foothill Blvd., Tujunga, CA 91042. (800) 876-5665 or (818) 353-2297. (Nov '90)

MacGraphics 111

MacGraphics is a collection of bit-mapped clip art on 13 thematic disks. Most pictures are full-page. and unfortunately, reproduction quality suffers when they are reduced. Version 3.0 reviewed. Thirteen-disk set, \$225. GoldMind Publishing, 4994 Tulsa Ave., Riverside, CA 92505. (714) 687-3815. (Feb '89)

Metro ImageBase Electronic Art \$\$\$%

Metro ImageBase Electronic Art is a series of TIFF and EPS clip art from the grandparent of the clipart industry. The traditional-look-ing images are huge, so have a large hard-disk drive handy. There are 18 volumes. Requires Mac Plus or later. \$145 per volume. Metro ImageBase, Inc., 18623 Ventura Blvd., Ste. 210, Tarzana. CA 91356. (800) 525-1552 or

(818) 881-1997. (Aug '89) Professional Photography Collection, Volume 1 1111

This CD-ROM contains 100 color TIFF images. Each image comes in three formats: 24-bit highresolution color, 24-bit lowresolution color, and 8-bit blackand-white. Strikingly clear, highquality images. Includes printed catalog and a liberal rights policy. Excellent buy. Requires Mac II series, a color monitor, and a CD-ROM drive. \$149. discimagery, 18 E. 16th St., New York, NY 10003.(212)675-8500.(Sept '90)

Totem Graphics \$\$\$\$% Totem Graphics provides 13 volumes of PostScript images in 24bit color. Color blends and fine details look superb even when printed in black-and-white. The 13 categories emphasize animals and plants but also include holidays, food, sports, hardware, and people. Images are available in four formats and are fully editable. Requires Mac Plus or later and a

hard-disk drive; requires Mac II series for color images. \$125 per category; \$995 for CD-ROM with all categories. Totem Graphics, 5109A Capitol Blvd., Tumwater, WA 98501.(206) 352-1851.(Oct 198

WetPaint ####

WetPaint is a ten-volume series that contains massive quantities of well-drawn MacPaint graphics. The best-seller is Classic Clip Art. Other titles include Publishing. Animal Kingdom, Special Occasions, Industrial Revolution, Island Life, and All the People. Art styles range from line drawings to digitized images, and several packages contain images reminiscent of woodcuts and other "antique" graphics. MacTut is a unique collection of ancient Egyptian artwork along with hieroglyphic fonts. All packages include ArtRoundup and Pattern Mover DAs. Each volume, \$79.95; MacTut, \$49.95. Dubl-Click Software, Inc., 9316 Deering Ave., Chatsworth, CA 91311. (818) 700-9525. (Sept '87)

DRAWING & PAINTING

Azimuth \$\$\$%

Azimuth isx a solid mapmaking program that lets you build maps of the earth based on a view from space. It produces excellent maps but suffers from interface problems. Its selection of export formats is too limited, often rendering its nice output difficult to use. Version 1.0 shipping. Requires Mac Plus or later. \$395. Graphsoft, Inc., 8370 Court Ave., Ste. 202, Ellicott City, MD 21043. (301) 461-9488. (Apr '90)

CA-Cricket Draw \$\$\$%

CA-Cricket Draw is an objectoriented drawing program that produces high-quality output. Prints on PostScript-compatible devices. Version 1.1.1 shipping. Requires Mac Plus or later, System 6.0.3 or later, and a second disk drive or hard-disk drive, \$199. Computer Associates International, Inc., 1240 McKay Dr., San Jose, CA 95131, (800) 531-5236 or (408) 432-1727. (May '87)

Canvas \$\$\$\$\$

Canvas 2.0 is a rich drawing/ painting program that features full Bezier curves; the cutting and joining of polygons; skewing, perspective, and distortion capabilities; auto-dimensioning; area and perimeter calculation; autotracing of bit maps; and full color support. Creates and edits highresolution bit maps to 2,540 dpi. Slightly less-powerful DA ver-sion available. Version 2.0 reviewed. Version 3.0 shipping. Requires Mac Plus or later and System 6.0.2 or later. \$399. Deneba Software, 3305 N.W. 74th Ave., Miami, FL 33122. (800) 622-6827 or (305) 594-6965. (Apr '89) * '89 Eddy

MiniFinders

Color MacCheese ###

Color MacCheese is an inexpensive, full-color painting program that is designed for artistic fun, not as a professional tool. Has two noncustomizable palettes, resolution is limited to 72 dpi, and there are no rulers. Only one document can be opened at a time. But for casual painters who want to get to work immediately, Color MacCheese is perfect. Version 1.05 reviewed. \$99. Delta Tao Software, Inc., 760 Harvard Ave., Sunnyvale, CA 94087, (800) 827-9316or (408) 730-9336. (Mar '91)

The Comic Strip Factory

The Comic Strip Factory is an assembly program for creating comic strips. Includes a database of parts for various characters as well as backgrounds for panels. Good text editing in balloons. Can import and export in MacPaint format. Version 1.0 reviewed. Version 1.6 shipping. Requires Mac Plus or later. \$69.95. Foundation Publishing, Inc., 14228 Shore Ln., Prior Lake, MN 55372. (612) 445-8860. (Dec '87)

DeskPaint and DeskDraw

DeskPaint and DeskDraw are reasonably full-featured painting and drawing programs in DA form. You can calibrate vertical and horizontal rulers in inches, centimeters, millimeters, picas, or points/pixels. Printer resolution can reach 4,000 dpi. DeskPaint has enough image-manipulating functions to satisfy any user except professional electronic artists. Version 3.03 reviewed. Requires a color display system, 2 MB of RAM, and a hard-disk drive. \$199.95. Zedcor, 4500 E. Speedway, #22, Tucson, AZ 85712.(602)881-8101.(Mar '91)

DrawTools tttt Draw Tools self-installs three DAs

for use with MacDraw II. Sizer does exact scaling and dimensioning, calculates enclosed areas, and lets you resize a drawing. Adjacency brings together any two selected objects. Tools adds a handy menu that lets you clip or extend existing lines and build fillets. Can be awkward to use. Version 1.1 reviewed. Requires Mac Plus or later and MacDraw II version 1.0v4 or 1.1v2, \$99.95. Paracomp, Inc., 1725 Montgomery St., San Francisco, CA 94111. (415) 956-4091. (July '90)

Easy Color Paint 1111

Easy Color Paint is a low-cost, basic 8-bit (256-color) paint program. Can print to color Quick-Draw printers. Four color palettes as well as two pattern palettes. Each palette has 38 patterns, and one is totally user-definable. Poor manual. Offers good performance for a very low price. Version 1.1 reviewed. Version 1.1 shipping. \$79. Creative Software, 55 Clinton Ave., New Providence, NJ

07974, (800) 367-6899 or (201) 665-9361. (Sept '90)

FreeHand 3.0 is a professional PostScript illustration package. Includes auto-trace, 100 levels of undo, freehand drawing, and powerful Blend command. Version 3.0 improves text manipulation but relies on dialog box for input. Fast screen redraw, New tool palettes (Layers, Colors, and Styles). Can edit in Preview mode. Allows Pantone, spot, or CMYK process color controls. Displays, separates, and prints 32-bit color TIFF images and generates color EPS files compatible with OPI (Open Prepress Interface) system. Steep learning curve but now has streamlined, easy-to-navigate interface. Version 3.0 reviewed. Requires Mac Plus or later and at least 2 MB of RAM, \$595, Aldus Corp., 411 First Ave. S., Seattle, WA 98104. (800) 333-2538 or (206) 628-2320. (July '91)

Illustrator is a professional-level color PostScript graphics program from the people who defined the PostScript language. Its powerful, compact toolbox has more drawing tools than did earlier versions. Its new charting functions let you import spreadsheet data as text, which are automatically converted into complex, easily customized charts (changes to imported numerical data also update the chart). Uses a freehand drawing mode or bit-mapped templates for detailed artwork. Version 3.0 reviewed. Requires Mac Plus or later. \$595. Adobe Systems, 1585 Charleston Rd., P.O. Box 7900, Mountain View, CA 94039, (800) 344-8335 or (415) 961-4400. (Feb '91) * 88 Eddy

MacCalligraphy \$\$\$1/2

MacCalligraphy simulates brush painting. User-designed Seals and Touches enable you to design a signature tool and the style of brush you use. Takes some getting used to. Handsome custom-built wooden box stores disks and documentation. Version 1.0 reviewed. Version 2.01 shipping. \$149.95. Qualitas Trading Co., 6907 Norfolk Rd., Berkeley, CA 94705. (415) 848-8080. (Feb '88)

MacDraft \$\$\$\$%

MacDraft is an object-oriented drawing program that offers a rich set of features for a moderate price. Object rotation is precise, and it accesses the full spectrum of 16.7 million colors. It is particularly appropriate for high-school or college-level introductory CAD classes or for small architectural/ construction contracting businesses. Version 2.0 reviewed. Version 2.1 shipping. Requires Mac Plus or later, System 6.0.3 or later, and a hard-disk drive or two floppy drives. \$399. Innovative Data Design, Inc. (IDD), 2280-A Bates Ave., Concord, CA 94520.

(415) 680-6818. (Oct '90) MacDraw II ttt/2

MacDraw II updates the venerable, popular object-oriented drawing program. Adds dithered and color patterns in its own documents but doesn't support color in PICT II format. Version 1.0 reviewed. Version 1.1v2 shipping. Requires Mac Plus or later. \$399. Claris Corp., 5201 Patrick Henry Dr., Santa Clara, CA 95052. (800) 544-8554 or (408) 727-8227. (Nov '88) * '85 Eddy

MacPaint ttt/ MacPaint hasn't lost its shine after all these years. Supports multiple windows, design templates, and a magic eraser for corrections. It lacks free-rotation and distortion. Version 2.0 reviewed. Requires Mac Plus or later. \$125. Claris Corp., 5201 Patrick Henry Dr., Santa Clara, CA 95052. (800) 544-8554 or (408) 727-8227. (July '88) * '85, '87 Eddy

Photon Paint ###

Photon Paint doesn't rival its highend competition, but it does offer a workable painting environment, multiwindow capability, some interesting special effects, and a lower price. Version 1.0 reviewed. Version 1.1 shipping. Requires Mac II with color card and System 6.0.3 or later. \$149.95. MicroIllusions, Inc., P.O. Box 3475, Granada Hills, CA 91394. (818) 785-7345. (May '89)

PixelPaint \$\$\$%

PixelPaint is a professional 256color (8-bit) painting program with a good interface, practical tools, and special effects. Works with many file formats. Four-colorseparation capability is built in. Includes PixelScan utility with excellent 8-bit imaging for Sharp and Howtek color scanners. Version 2.0 reviewed. Version 2.1 shipping. Requires Mac II series or SE/30 with 8-bit-color board and 2 MB of RAM, System 6.0.3 or later, a color monitor, and a hard-disk drive, \$249. SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086. (408) 245-2202. (Oct '89)

PixelPaint Professional *** PixelPaint Professional is an upgrade from the original, groundbreaking PixelPaint. This version's difficult interface sometimes hides the well-designed painting tools' capabilities. Supports four 256-color palettes per document and offers extensive support for CMYK color separations. Includes several colorblending and -manipulating tools as well as anti-aliasing capabilities. Still has a few glitches but is a serious and powerful tool for electronic artists. Lacks an independent PostScript text layer. Ex-cellent documentation. Version 1.0 reviewed. Version 2.0 shipping. Requires 24-bit-color display system, 4 MB of RAM, and a hard-disk drive. \$799. SuperMac

Technology, 485 Potrero Ave., Sunnyvale, CA 94086. (408) 245-2202. (Mar '91)

Studio/1 tttt/2

Studio/1 is an excellent monochrome painting program that also has impressive flip-frame animation capabilities. It has an uncluttered animation surface, painting tools with 300-dpi capabilities, and a HyperCard playback utility (XCMD). Version 1.0 reviewed. Requires Mac Plus or later. \$149.95. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. (800) 245-4525 or (415) 571-7171. (Sept '89)

Studio/32 tttt/2

Many graphic artists think that this is the ideal color-painting program. Studio/32 provides many special tools and effects, including airbrush, gradients and blends, smudge, and anti-aliasing. A PostScript text layer keeps letters fully editable and as sharp as the available printer will allow. Its unusual effects include spherization; perspective; free rotation; resizing/stretching; transparency; and the "magic wand," which selects only certain pixels within an adjustable color range. Despite its power, Studio/ 32 is exceptionally easy to use. Version 1.0 reviewed. Requires 24-bit-color display, 5 MB of RAM, and a hard-disk drive. \$695. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. (800) 245-4525 or (415) 571-7171. (Mar '91) * '90 Eddy

Super 3D tttt

Super 3D is an update of an excellent 3-D object-oriented drawing program. Powerful features are easy to use. Three solidrendering modes. Can export a scene as object-oriented 2-D snapshot in PICT or EPS. Vertexlevel editing gives precise control over every facet of objects. Easy to make global changes. Version 2.04 reviewed. Version 2.1 shipping. Requires Mac Plus or later, System 6.0.3 or later, and a harddisk drive; requires Mac II series or later for color work. \$495. Aldus Corp., 411 First Ave. S., Seattle, WA 98104. (800) 333-2538 or (206) 628-2320. (Mar '90)

SuperPaint \$1%

SuperPaint 2.0 is a combination painting/drawing program that includes features such as plug-in tools, auto-trace, Bezier curves, support for resolutions exceeding 300 dpi, and eight-color support. A good program but not particularly fast. Version 2.0 reviewed. Requires Mac Plus or later, \$199. Aldus Corp., 411 First Ave. S., Seattle, WA 98104. (800) 333-2538 or (206) 628-2320. (July '89) ★ '87 Eddy

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UltraPaint \$\$\$%

UltraPaint is an 8-bit-colorgraphics program best suited for those new to computer graphics and color, but experienced artists may also find it useful. It's a solid painting package with all the basic tools plus a variety of specialized tools and modes. It does have a somewhat quirky interface. Version 1.0 reviewed. Requires Mac II series or LC with color monitor, \$199. Deneba Software, 3305 N.W. 74th Ave., Miami, FL 33122. (800) 622-6827 or (305) 594-6965. (Sept '90)



Apple Macintosh Portable \$\$\$\$%

This portable computer is bigger than a laptop, but it works well on the road, because of its long battery life. Its large high-quality screen, standard keyboard, and full Mac performance and attributes make it comfortable to use as your primary computer. With 2 MB of RAM and a 40-MB hard disk, \$4,199; with 4 MB of RAM and a 40-MB hard disk, \$4,699. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Sept '90) * '89 Eddy

CasioLink for the Macintosh

\$\$\$\$%

The CasioLink is a hardware/ software package that links the popular Casio BOSS series of electronic organizers to a Mac. The software is a bit limited and clunky, but it works. Can import and export to text files and HyperCard stacks but has some trouble importing from stacks. Version 1.01. shipping. Requires Mac Plus or later and Casio BOSS. \$109. Casio, 570 Mount Pleasant Ave., Dover, NJ 07801. (201) 361-5400. (May '90)

Colby SE/30 \$\$\$1/2

This powerful portable computer has hardware contrast and brightness controls for better viewing. Battery life up to three hours. Can be upgraded with optional hard disks and 8 megabytes of RAM. Not meant to be used in transit. Annoying screen flicker. Floppy-only version, \$6,699. Colby Systems, 2991 Alexis Dr.,

Palo Alto, CA 94304. (415) 941-9090. (Sept '90) Ergotron Workstation \$\$\$\$

The Ergotron Workstation is the best, most versatile computer workstation available. This freestanding or wall-mountable heavy steel unit includes a high shelf for your Mac II and a movable support arm for your monitor. The unit comes in a variety of configurations. \$600 and up. Ergotron, Inc., 3450 Yankee Dr., Ste. 100, Eagan, MN 55121. (800) 888-8458 or (612) 452-8135. (Mar'89)

Hewlett-Packard 48SX

Calculator \$\$\$\% The 48SX is HP's most powerful, versatile, and expensive calculator. It supports file transfers with Macs, using the Mac Kermit program. The calculator includes a powerful graphical equation editor and a matrix editor that resembles a spreadsheet program. Programs and variables are stored by name in a directory. The calculator uses sound output, a realtime clock with alarms, and infrared and RS-232 serial ports as well as RAM and ROM expansion ports. The Serial Interface Kit adds considerable power but could use improvements. \$350; Serial Interface Kit, \$59.95. Hewlett-Packard Co. (Calculator Sales), 1000 N.E. Circle Blvd., Corvallis, OR 97330. (800) 752-0900 or (503) 752-7736. (Mar '91) KeyLock \$\$\$\$\%\$

The KeyLock is a security package that has a piece of hardware that's inserted into the floppy-disk slot (and can be physically locked) and an INIT that requires the correct password during startup. Includes a DA that darkens the screen and requires the same password. INIT and DA portion are easily bypassed. \$129.95. VikingTech, 533 ½ Via De La Valle, Ste. E, Solana Beach, CA 92075. (619) 792-1385. (July '90) MacTable \$\$\$\$\$

The MacTable is an elegant Danish worktable that holds a Mac and a printer with room to spare. The table, 30 inches deep by 58 inches wide, is made of particleboard and must be assembled. Cabinet is optional. 46-inch table, \$329; 58-inch table, \$359; cabinet, \$159. ScanCo, P.O. Box 3217, Redmond, WA 98073. (800) 722-6263 or (206) 481-5434. (Jun '90)

Mobile Computer 400 \$\$\$\$ The Mobile Computer 400 is a portable computer small enough to carry, and it's relatively inex-pensive. It has a proprietary operating system but uses a pull-down menu and a pointer that's controlled by a built-in touch pad reasonably intuitive for Mac owners. \$1,795. Psion, 118 Echo Lake Rd., Watertown, CT 06795. (203) 274-7521. (July '90)

Orange Micro Grappler ttt The Grappler LX connects Macs to laser and 24-pin letter-quality

printers that have parallel interfaces. A cable, driver software, and special fonts combine to make non-PostScript printers compatible with the Mac. Grappler LS uses serial, not parallel, connections. Performance with HP-compatible printers is slow but adequate. Has a built-in spooler. Version 1.0 reviewed. Requires Mac Plus or later, System 6.0.3 or later, a hard-disk drive, and I MB of printer RAM. LX version, \$199; LS version, \$99. Orange Micro, Inc., 1400 N. Lakeview Ave., Anaheim, CA 92807. (714) 779-2772. (Nov '88) * '87 Eddy

Outbound Laptop System \$\$\$ This portable computer is among the lightest portables. No SCSI or ADB. Difficult-to-use cursor control. Few Mac capabilities. Has some software incompatibilities. Requires Mac Plus or SE. Floppyonly version with ROM chips, \$2,899; version with 40-MB hard drive and ROM chips, \$3,699. Outbound Systems, 4840 Pearl E. Cir., Boulder, CO 80301. (303) 786-9200. (Sept '90)
Portable Attache \$\$\$\$

The Portable Attache is an attractive alternative to the Mac Portable case. Manufactured by Zero Halliburton, it's made of aluminum, is approximately the same size as the Mac Portable case, and comes with a handy accessory case (the perfect size for a Diconix printer) that fits inside. The file pocket in the Portable Attache detaches and becomes a portfolio. It's not suitable for checking on an airline, but the Portable Attache/Transport case (also available exclusively from EDC) is. Requires Mac Portable. \$329.95; Portable Attache/Transport case, \$369.95. EDC, 13101 Washington Blvd., Ste. 110, Los Angeles, CA 90066. (213) 578-9712. (Sept

COMMUNICATIONS

Abaton InterFax 24/96 ttt/2

The InterFax 24/96 is a fax modem capable of either 2,400-bps data transmission or 9,600-bps facsimile transmission. Fax mode allows sending as well as receiving. The InterFax 24/96 incorporates automatic data/fax switching, polling support, activity reports, good print times, and good regaincontrol times. Error correction is MNP Class 4, and data compression is MNP Class 5. Lacks features such as user-definable cover pages, a Preview mode, and scaling. Off-hook times are long, which can cause higher phone charges, but creating a fax is fast. \$595. Abaton (Everex Systems). 48431 Milmont Dr., Fremont, CA 94538. (800) 444-5321 or (415) 683-2226. (May '91) * '89 Eddy

Anchor Automation 24E5

MacPac ttt

This 2,400 bps modem has average performance, but it comes with a five-year warranty. Its MNP 5 data compression is slow but effective. The modem is bundled with QuickLink II software, a terminal-emulation program that doesn't help in setting up the modem for full data compression or error correction. Requires Mac Plus or later. \$339. Anchor Automation, Inc., 20675 Bahama St., Chatsworth, CA 91311. (818) 998-6100. (Jan '91)

Applied Engineering DataLink

Express \$\$ 1/2

This 2,400-bps modem's slow performance is partly due to MNP compression, and the bundled Terminal 1.5 software doesn't help in setting up data compression or error correction. The modem comes with its own hardwarehandshaking cable, necessary for data-flow control. \$249; with fax, \$349. Applied Engineering, 3210 Belt Line Rd., Dallas, TX 75234. (214) 241-6060. (Jan '91)

Computer Friends LightFax 9624 \$\$

The LightFax 9624 is a fax modem capable of either 2,400-bps data transmission or 9,600-bps facsimile transmission. Fax mode allows sending as well as receiving. The inexpensive LightFax 9624 features voice-call detection and has good print times. But this fax modem isn't particularly fast, choked on a simple PageMaker test document, has long regaincontrol times, and suffers from a clumsy software interface. No Preview mode. The documentation is almost as bad as an average manual for DOS software. \$549; networkable version, \$799. Computer Friends, Inc., 14250 N.W. Science Park Dr., Portland, OR 97229. (800) 547-3303 or (503) 626-2291. (May '91)

Computer Friends Lightspeed

2400LE \$\$\$1/2 The price/performance of this 2,400-bps modem makes it a best buy. If you buy one, make sure the

right cable — the CBL-124 — is included. It's not as fast as modems using V.42bis compression, but the Lightspeed is faster than all the others that use MNP 5 compression. \$159. Computer Friends, Inc., 14250 N.W. Science Park Dr., Portland, OR 97229. (800) 547-3303 or (503) 626-

2291. (Jan '91) Cypress Research FaxPro \$\$\$ The FaxPro is a fax modem capable of either 2,400-bps data transmission or 9,600-bps facsimile transmission. Fax mode allows both sending and receiving. The FaxPro incorporates activity reports and turns in good times for printing, regain-control, and offhook. A Preview mode and an Exact Scale option are provided, but there's no graphics-conversion feature and the cover pages are inflexible. Expensive for standalone use. Networkable version, \$1,099; FaxShare version, \$1,199. Cypress Research, 766 San Aleso Ave., Sunnyvale, CA 94086. (408) 752-2700. (May '91)
Dove DoveFax Desktop ttt

The DoveFax Desktop is a fax modem capable of either 2,400bps data transmission or 9,600bps facsimile transmission. Fax mode allows sending as well as receiving. The compact DoveFax Desktop allows flexible cover pages and provides fast off-hook and print times as well as good regain-control times. At test time, it lacked an enveloping option (sending several faxes to different destinations) and directory export/ import capability. This fax modem, even with some missing features, won top honors in our May '91 lab report. \$449. Dove Computer Corp., 1200 N. 23rd St., Wilmington, NC 28405. (800) 622-7627 or (919) 763-7918. (May '91) FAXstf \$\$\$

The FAXstf was an early entrant in the fax-modem race. Its performance is adequate but slower than that of most fax machines. Using it as a normal modem requires changing plugs. Version 1.03 reviewed. Requires MacPlus or later and a hard-disk drive. \$445. STF Technologies, Inc., P.O. Box 81, Concordia, MO 64020. (816) 463-2021. (Feb '89)

Global Village TelePort A300 \$\$\$\$%

This small 2,400-bps modem has an excellent price and solid performance. It connects to an ADB port rather than a serial port. The software puts information on connection status, transmission speed, and the number of characters transmitted per second onto the desktop menu bar. The manual is exemplary. It's not the fastest modem available, but it's as good as any other 2,400-bps modem. Requires Mac SE or later. \$225. Global Village Communication. 1204 O'Brien Dr., Menlo Park, CA 94025. (415) 329-0700. (Jan '91) * '90 Eddy

Hayes V-series Smartmodem 2400 \$\$\$\$%

This modem showed outstanding performance in our tests. Its V.42bis compression lets it operate twice as fast as modems with the alternative MNP 5. In some instances, its data-compression schemes let it approach 9,600-bps throughput. Software is easy to use and intuitive. \$649; bundled with Smartcom II and Hayes Connect, \$699. Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348. (404)

441-1617. (Jan '91) Hayes V-series Smartmodem 9600 \$\$\$\$%

The V-series Smartmodem 9600 is one of the fastest modems available for the Mac. For high speeds, you need a special cable and software that supports the V.42 and X.25 protocols. Requires

Mac 512Ke or later, Mac-to-modem cable, and communications software. \$999; with cable, Smartcom II for the Mac, and HavesConnect software, \$1,049. Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348. (404) 441-1617. (Jan

HyperDialer \$\$\$%

HyperDialer provides an interface between a phone and your Mac so you can dial a number by using a Rolodex-type program such as SideKick, Focal Point, or QuickDEX. Connects between the Mac's sound port and a telephone handset. Works with any Mac except SE/30, Classic, LC, or IIsi. \$49.95; adapter for Mac II series, \$5. DataDesk International, Inc., 9330 Eton Ave., Chatsworth, CA 91311. (800) 826-5398 or (818)

998-4200. (Sept '88) Intel 2400EX MNP-Macintosh

This 2,400-bps modem delivers average performance. Its software requires manual setup for data compression and error correction. Before buying, double-check to see that it includes the right cable for hardware flow control. The modem has a five-year warranty. \$369. Intel Corp., 5200 N.E. Elam Young Pkwy., Hillsboro, OR 97124. (800) 538-3373 or (503) 696-8080. (Jan '91)

Orchid OrchidFAX 111

The OrchidFAX is a fax modem capable of either 2,400-bps data transmission or 9,600-bps facsimile transmission. Fax mode allows sending as well as receiving. The OrchidFAX can send Mac files at 9,600 bps to other Orchid-FAX modems or an AppleFax and has fast regain-control times along with LQ fonts and a two-year warranty. However, these capabilities aren't enough to compensate for the lack of features in the software provided (a customized version of the venerable BackFAX from Solutions). Performance isn't good over impaired phone lines, and printing is slow. \$599. Orchid Technology, 45365 Northport Loop W., Fremont, CA 94538. (800) 767-2443 or (415) 683-0300. (May '91)

Prometheus MaxFax 11/2

The MaxFax is a fax modem capable of either 2,400-bps data transmission or 9,600-bps facsimile transmission. Fax mode allows sending as well as receiving. The inexpensive MaxFax incorporates unique gray-scale capability and is bundled with good telecommunications software. This product had the longest times for regain-control, offhook, and printing when tested against comparable units. Coverpage options are limited, and enveloping capability for different fax destinations isn't available. \$449. Prometheus Products, Inc., 7225 S.W. Bonita Rd., Tigard,

OR 97223. (800) 477-3473 or (503) 624-0571. (May '91)

Prometheus ProModem 2400M Plus tttt

Although this modem has only average performance, its operation and the bundled software are hassle-free Software (Mac-KNOWLEDGE 2.0) installation is straightforward and lets you easily set the modem for error correction and slow-but-reliable MNP 5 data compression, \$299. Prometheus Products, Inc., 7225 S.W. Bonita Rd., Tigard, OR 97223. (800) 477-3473 or (503) 624-0571. (Jan '91) Telax RA2110M \$\$\$

The Tefax RA2110M is a combination regular fax machine/fax modem. Although this sounds like the best of both worlds, it's not. This unit lacks many necessary fax-machine features (such as a paper cutter), and the fax-modem software (a customized Back-FAX) isn't very good. You'd do better to buy a fax machine and a separate fax modem. Requires Mac Plus or later, System 6.0.3 or later, and a 20-MB hard disk. \$1,295. Relisys, 320 S. Milpitas Blvd., Milpitas, CA 95035. (800) 735-4797 or (408) 945-9000. (Jun '90)

Zoom Telephonics Zoom/ Modem V.42bis tttt/2

The Zoom/Modem is a reasonably priced 2,400-bps modem with excellent performance. It uses V.42bis compression, which reduces transfer times. Transmission rate came close to 9,600 bps in some of our tests. The bundled cable supports data-flow control. \$199; cable, \$12. Zoom Telephonics, Inc., 207 South St., Boston, MA 02111. (800) 631-3116 or (617) 423-1072. (Jan '91)

DISPLAY SYSTEMS

Aapps MicroTV ttt%

The MicroTV is a NuBus board that puts a small (128-x-108-pixel) video or broadcast image onscreen. Performance depends on reception and input. Generally poor resolution. Doesn't use the Mac's audio capabilities. Can perform on-the-fly frame captures. Control DA is elegant. Version 1.03 reviewed. Version 1.2 shipping. Requires Mac II or later. \$395. Aapps Corp., 756 N. Pastoria Ave., Sunnyvale, CA 94086. (408) 735-8550. (May '90)

Apple Macintosh 12" Monochrome Display \$\$\$

This 12-inch monochrome monitor has good geometry. Due to the antiglare etching, users can experience focus problems. The screen is dim. Resolution is 74 dpi. Requires Mac II series with video card (optional with Mac IIci and IIsi). Monitor only, \$299; card, \$648. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Apr '90)

Apple Macintosh Portrait Display \$\$\$\$%

This high-quality, full-page monitor is possibly the best available - but it's expensive. Its screen resolution is slightly below true WYSIWYG, so things appear a bit small. Can produce up to 256 levels of gray, using an 8-24 card. The monitor cable doesn't fit all third-party video cards, so check before you buy. Requires Mac II series with video card (optional with Mac IIci and IIsi). \$1,099. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Feb '91) ★ '89 Eddy

Apple Two-Page Monochrome Monitor \$\$\$\$

This 21-inch monochrome display monitor is dim but has good focus. It has moderate glare protection, and a simple gray-scale upgrade is available. It has a small active-screen area. Rated second in MacUser Labs testing of large monochrome monitors. Requires Mac II series with video card. Monitor, \$2,149; video card, \$648. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408)

996-1010. (Apr '90) AppleColor High-Resolution RGB Monitor \$\$\$\$%

The AppleColor High-Resolution RGB Monitor is standard among 13-inch monitors. It's very bright, with no built-in glare protection. Can support 24-bit color when used with the Macintosh 8-24 and 8.24 gc cards. Its 69-dpi screen resolution gives a slightly larger-than-WYSIWYG image. Very reliable. Requires video card (optional with Mac LC, IIci, and IIsi). \$999. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (May '90)

The Big Picture ttt This 17-inch monochrome display has a greenish high-persistence phosphor. Screen sharpness is poor, but focus is OK. Brightness is uneven, and there is slight ghosting. Requires Mac 512Ke or later. \$1,650. E-Machines, Inc., 9305 S.W. Gemini Dr., Beaverton, OR 97005. (800) 344-7274 or

(503) 646-6699. (Apr '90) CalComp DrawingCard ChromaVision \$\$\$

This 21-inch color monitor displays two A4 pages. Screen coloration is uneven. No bundled software. Accelerated QuickPlus video card planned for mid-1991 release. Requires Mac II series. 8bit Chroma Vision, \$5,995; 24-bit ChromaVision Plus, \$6,995; accelerated 24-bit ChromaVision QuickPlus, \$8,595. CalComp. 2411 W. La Palma Ave., Anaheim, CA 92801. (800) 225-2667 or (714) 821-2000. (May '90)

CalComp DrawingCard GrayVision \$\$\$ This gray-scale display system has

above-average brightness, gray linearity, and geometry ratings. Has glare protection. Belowaverage sharpness and focus. Poor screen-nuisance rating. Video card isn'tcolor-capable. Requires Mac II series. \$2,995. CalComp, 2411 W. La Palma Ave., Anaheim, CA 92801. (800) 225-2667 or (714) 821-2000. (Oct '90)

ColorSpace Ili/FX tttt

The ColorSpace IIi/FX brings live 24-bit video to the Mac. The FX board converts TV signals so they can be displayed on the Mac. Offers sophisticated special effects. The III lets you mix live video with computer graphics. Includes Digitizer DA to grab frames for export; also has Video Author tool kit for HyperCard authoring. Requires Mac II series and appropriate cable. IIi and ColorSpace FX bundle, \$2,495. Mass Micro-systems, Inc., 810 W. Maude Ave., Sunnyvale, CA 94086. (800) 522-7979 or (408) 522-1200. (Mar '90) * '88 Eddy

Cutting Edge Full Page Display \$\$

The Cutting Edge Full Page Display has a 15-inch-diagonal monochrome screen with average image quality. Screen geometry is good, and nuisance factors are minimal. Video cards are available for the SE, SE/30, and Mac II series. Comes with a tilt/swivel stand. \$899. Cutting Edge, 97 S. Red Willow Rd., Evanston, WY 82930. (307) 789-0582. (Feb '91)

DTI SpeedView ttt The SpeedView is a full-page display that can show an entire actualsize tabloid page. Designed for professional publishers who need large screen acreage. Image quality is impressive and is competitive with smaller 15-inch displays. Comes with monochrome or gray-scale card plus tilt/swivel stand. Requires Mac II family. Monochrome, \$2,495; gray scale, \$3,195. DTI (Digital Technology International), 500 W. 1200 S., Orem, UT 84058. (801) 226-2984.

(Feb '91) E-Machines ColorPage T16/8

The ColorPage T16/8 is consistently rated the best and brightest 8-bit-color monitor by MacUser Labs. The monitor is a razor-sharp Sony Trinitron, and the video card is also excellent. Requires Mac II series. With 8-bit card, \$2,995. E-Machines, Inc., 9305 S.W. Gemini Dr., Beaverton, OR 97005. (800) 344-7274 or (503) 646-6699. (May '90) ★ '88 Eddy E-Machines QuickView Z21

This 21-inch monochrome monitor has four dpi settings (36, 40, 72, or 80). Dim and not very sharp. Video card allows a simple grayscale upgrade. Virtual screen. Good software. Average focus. Requires Mac SE, SE/30, or II series. \$2,490; Mac SE version, \$1,995. E-Machines, Inc., 9305 S.W. Gemini Dr., Beaverton, OR 97005. (800) 344-7274 or (503)

646-6699. (Apr '90) E-Machines T19 \$\$\$\$\%

This 19-inch color monitor has a fairly sharp screen. The color is excellent, and the screen is free of nuisances. Great software. Requires Mac SE/30 or II series with NuBus adapter. \$5,995. E-Machines, Inc., 9305 S.W. Gemini Dr., Beaverton, OR 97005. (800) 344-7274 or (503) 646-6699. (May '90)

E-Machines T19/24 \$\$\$\$\%

This 24-bit-color display system combines the E-Machines T19 monitor with a 24-bit-video card. This high-quality, affordable combination delivered excellent overall performance in our labreport testing. The 19-inchdiagonal screen size provides enough desktop real estate for nearly all professional applications. Sharpness, focus, and color quality are outstanding. Good 39page manual. Our test unit had slight, almost imperceptible streaking along bottom edge of active screen area. Requires Mac II series. \$7,390 (includes monitor and 24-bit video card). E-Machines, Inc., 9305 S.W. Gemini Dr., Beaverton, OR 97005. (800) 344-7274 or (503) 646-6699. (May '91)

E-Machines TX \$\$\$\$\$

The TX uses the same monitor as the T16 but has a higher-resolution video card. The 87-dpi screen resolution is good for CAD and freehand drawing but not for WYSIWYG desktop publishing. Excellent convergence and software. Requires Mac SE/30 or II series with NuBus adapter, \$4,495. E-Machines, Inc., 9305 S.W. Gemini Dr., Beaverton, OR 97005. (800) 344-7274 or (503) 646-6699. (May '90)
E-Machines TX/24 \$\$\$\$\frac{1}{2}\$\$

This 24-bit-color display system combines the E-Machines TX monitor with a 24-bit-video card. Delivers very good overall per-formance. The 16-inch-diagonal screen size should be large enough for most professional applications. This monitor provides a non-WYSIWYG, 87-dpi image that displays plenty of information at somewhat-reduced scale - good for page layout but a problem when you need to read small type. Excellent sharpness, focus, bright-ness, and color quality. Requires Mac SE/30 or II series with NuBus adapter. \$5,190. E-Machines, Inc., 9305 S.W. Gemini Dr., Beaverton, OR 97005. (800) 344-7274 or (503) 646-6699. (May '91)

Ehman Full Page Display

Considering its price, the Ehman Full Page Display with 15-inchdiagonal monochrome screen is well worth the investment. Performance is not as good as that of

some of the more expensive monitors, and image quality is average. Video cards are available for the SE, SE/30, and Mac II series. Comes with tilt/swivel stand. \$499 list. Ehman Engineering, Inc., 97 S. Red Willow Rd., Evanston, WY 82930. (800) 257-1666 or (307) 789-3830. (Feb '91)

Ehman Two-Page Monitor

This 19-inch monochrome monitor has good brightness and focus. Glare and other nuisance factors such as jittering are a problem. Includes Stepping Out II software. Requires SE, SE/30, or Mac II series. \$899. Ehman Engineering, Inc., 97 S. Red Willow Rd., Evanston, WY 82930. (800) 257-1666 or (307) 789-3830. (Apr '90)

General Parametrics StarTime/VideoShow tt

The StarTime/VideoShow is a hardware/software combination for color presentations. Using the VideoShow box and a monitor, you can play back presentations without a Mac. Software is clunky and doesn't take advantage of Mac graphics. Version 1.0 reviewed. Version 2.1 shipping. Requires Mac SE or later, System 6.0.3 or later, presentation software, a 20-MB hard-disk drive, VideoShow Model, and a color monitor. StarTime, \$199; VideoShow Model 260, \$3,995; Model 280, \$8,995; Model 280XP, \$5,995 to \$7,995. General Parametrics Corp., 1250 Ninth St., Berkeley, CA 94710. (800) 223-0999 or (415) 524-3950. (Nov '89)

Generation Systems CT-20

This 20-inch color monitor is bright and fairly sharp. Excellent color quality and software. Hardware capabilities include pan and zoom (with 24-bit card only). Requires SE/30 or Mac II series. 8-bit (Mac II or SE/30), \$3,999; 24-bit (Mac II only), \$5,595. Generation Systems, Inc., 1185-C Bordeaux Dr., Sunnyvale, CA 94089. (800) 525-5811 or (408) 734-2100. (May '90)

Lapis DisplayServer II-DPD

The DisplayServer II-DPD is a monochrome NuBus video card that lets a Mac II run PC-compatible VGA monitors. The card has occasional problems with some Mac programs, and it isn't cost-effective with a small monitor. Users on a budget, however, can save hundreds of dollars by using this card with a recycled big VGA monitor — it produces a crisp, jitter-free image. Requires Mac II series. \$549. Lapis Tech-nologies, 1210 Marina Village Pkwy., Ste. 100, Alameda, CA 94501.(415)748-1600.(June '91)

MacGenius tttt

This 15-inch monochrome monitor has a warm-color phosphor and bright screen. It has good software with inverse-video ca-

pability. Card difficult to install. Screen resolution is 80 dpi. Requires Mac Plus or SE. \$1,495. Genius Technology, 755 E. 31st St., Hastings, MN 55033. (800) 328-9524 or (612) 437-2233. (Apr

MacTel Index Portrait ###

The MacTel Index Portrait provides a 15-inch-diagonal monochrome display with average image quality. Focus is below average but adequate if you don't read fine print on-screen. More expensive than comparable monitors. Video cards are available for the SE, SE/30, or Mac II family. Comes with a tilt/swivel stand. \$625. MacTel Technology, 3007 N. Lamar Blvd., Austin, TX 78705. (800) 950-8411 or (512) 451-2600. (Feb '91)

MagicView \$\$\$\% This 19-inch monochrome monitor is bright and has fair focus. The phosphor is bluish. Geometry is good but within a tilted and off-center display. Screen resolution is 85 dpi. Requires Mac Plus or later. \$899. Mac Products USA, Inc., 8303 Mopac Expy., Ste. 218, Austin, TX 78759. (800) 622-3475

or (512) 343-9441. (Apr '90) MegaGraphics 2008 \$\$\$\$ This Sony 19-inch color monitor is not very sharp but has good focus. Color quality is excellent. Monitor with 8-bit card for Mac II, \$5,948; monitor with 8-bit card for SE/30, \$5,998. MegaGraphics, 439 Calle San Pablo, Camarillo, CA 93012. (800) 487-6342 or (805) 484-3799. (May '90) MegaGraphics 2024 16" \$\$\$\$\$\$

This 24-bit-color display system combines a Sony Trinitron monitor with a 24-bit-video card. This high-quality, high-resolution system delivers good overall per-formance. The 16-inch-diagonal screen size is adequate for most professional applications. The display is not WYSIWYG, because of the condensed 88-dpi pixel density, but it lets you see a lot of your layout or artwork onscreen. Sharpness, focus, brightness, and color quality are excellent. Requires Mac II series. \$6,795. MegaGraphics, 439 Calle San Pablo, Camarillo, CA 93012. (800) 487-6342 or (805) 484-3799. (May '91)

MegaGraphics Rival \$\$\$\$ This 19-inch monochrome display has true white phosphor and one of the brightest screens available. Focus and geometry are average. Resolution is 75 dpi. Requires Mac Plus, SE, SE/30, or II series. \$1,698. MegaGraphics, 439 Calle San Pablo, Camarillo, CA 93012. (800) 487-6342 or (805) 484-3799. (Apr '90) Mirror PixelView I \$\$\$\%

This monochrome full-page dis-

play system is unique because it can be used with a Mac Plus. Comes with a screen saver and large-cursor option and useful

software to manage pop-up menus and the menu bar. Image quality is average. Video cards are also available for the SE, SE/30, and Mac II series. Comes with tilt/ swivel stand. Requires Mac Plus or later, \$477, Mirror Technologies, Inc., 2644 Patton Rd., Roseville, MN 55113. (800) 654-5294 or (612) 633-4450. (Feb '91) Mirror ProView/24 ttt

This 24-bit-color display system combines an Ikegami Trinitron with a 24-bit-video card. A highquality, affordable combination, this system delivers good overall performance. The 19-inch-diagonal screen size is large enough for most professional applications. Sharpness, focus, and color quality are excellent, but geometry is slightly off. Good software. Requires Mac II series. \$3,997. Mirror Technologies, Inc., 2644 Patton Rd., Roseville, MN 55113. (800) 654-5294 or (612) 633-4450. (May '91)

Mobius One Page Display

The Mobius One Page Display is a 15-inch monochrome full-page display that's a good choice for SE owners. Software for the SE model provides multiscreen capability, a screen saver, acceleration control, and other features. Video cards are available for the SE, SE/30, and Mac II series. The interface card that comes with the SE model is also a CPU accelerator that speeds up all processing. Has antiglare coating and comes with a tilt/swivel stand, \$795 list. Mobius Technologies, Inc., 5835 Doyle St., Emeryville, CA 94608. (800) 669-0556 or (415) 654-0556. (Feb '91)

Moniterm Viking 2/72 \$\$\$\$ This 19-inch monochrome monitor has optional OCLI coating for glare control, is very sharp, and has good focus. Few screen nuisances. Screen resolution is 72 dpi. Requires Mac SE. \$1,795. Moniterm, 5740 Green Circle Dr., Minnetonka, MN 55343. (800) 933-5740 or (612) 935-4151. (Apr

Moniterm Viking 2400 11/2

This 24-inch monochrome monitor has few screen nuisances. Poor focus and geometry. Optional OCLI antiglare coating. Requires Mac SE. Monitor, \$1,595; monitor with OCLI antiglare treatment, \$1,995; video board, \$495. Moniterm, 5740 Green Circle Dr., Minnetonka, MN 55343, (800) 933-5740 or (612) 935-4151. (Apr '90)

Moniterm Viking C24 \$\$\$\$

This 24-bit-color display system combines an Ikegami Trinitron monitor with a 24-bit-video card. This high-quality but relatively high-priced combination delivers good overall performance. The 20-inch-diagonal screen size is large enough for nearly all professional applications. Sharpness, focus, and color quality are excel-lent. Requires Mac II series. \$7,490. Moniterm, 5740 Green Circle Dr., Minnetonka, MN 55343. (800) 933-5740 or (612) 935-4151. (May '91)

Nutmeg 19" Mono Display

This 19-inch monochrome monitor is bright and has average-quality focus. Geometry is fair. Phosphor is bluish with a yellowish center. Includes Stepping Out II. Screen resolution is 72 dpi. Requires Mac Plus, SE, SE/30, or II series. \$1,699. Nutmeg Systems, 25 South Ave., New Canaan, CT

06840. (203) 966-3226. (Apr '90) PCPC II 16" Color \$\$\$\$

This 24-bit-color display system combines a Sony Trinitron monitor with a 24-bit-video card. A high-quality, affordable combination, this system delivers good overall performance. The 16-inchdiagonal screen size is large enough for most professional applications, but the 82-dpi pixel density produces an image that may appear too condensed. Sharpness, focus, and color quality are excellent. Includes Stepping Out II software. Requires Mac II series, \$3,495, PCPC (Personal Computer Peripherals Corp.), 4710 Eisenhower Blvd., Bldg. A4, Tampa, FL 33634. (800) 622-2888 or (813) 884-3092.

PCPC II 19" Color \$\$\$\$ This 24-bit-color display system combines a Ikegami Trinitron monitor with a 24-bit-video card. A high-quality, affordable combination, this system delivers good overall performance. The 19-inchdiagonal screen size is large enough for nearly all professional applications. Sharpness, focus, and color quality are excellent, but color is slightly misconverged. Includes Stepping Out II software. Requires Mac II series. \$4,995. PCPC (Personal Computer Peripherals Corp.), 4710 Eisenhower Blvd., Bldg. A4, Tampa, FL 33634. (800) 622-2888 or (813)

884-3092. (May '91) PCPC II 21" Color Graphics System \$\$\$%

This 21-inch color monitor has a sharp screen image. Eight-bit color is excellent, but gray linearity is poor. Noticeable flicker. Includes Stepping Out II software. Requires Mac II. \$5,995 with 8-bit card. PCPC (Personal Computer Peripherals Corp.), 4710 Eisenhower Blvd., Bldg. A4, Tampa, FL 33634. (800) 622-2888 or (813) 884-3092. (May '90)

PCPC Shadowgraph \$\$\$\$\$

The PCPC Shadowgraph system includes a 19-inch monochrome Ikegami monitor and an 8-bitvideo card, delivering excellent gray linearity and MTF sharpness, with good focus and geometry. Only 2 or 256 gray levels, but gray-scale image is superb. Step-

ping Out II software included. Skimpy documentation. Tilt/ swivel stand. Requires Mac II series. \$1,795. PCPC (Personal Computer Peripherals Corp.), 4710 Eisenhower Blvd., Bldg. A4. Tampa, FL 33634. (800) 622-2888 or (813) 884-3092. (Oct '89)

Princeton MultiView II \$1% The overall performance of this 15-inch-diagonal, monochrome full-page monitor was below average in our lab tests. Screen geometry and focus are poor. Price is high considering the quality. Comes with a tilt/swivel stand. With board for SE or SE/30, \$845; with board for Mac II series, \$995: antiglare treatment, \$75. Princeton Publishing Labs, Inc., 19 Wall St., Princeton, NJ 08540. (609) 924-1153. (Feb '91)

Radius Color Pivot ###

The Radius Color Pivot is an impressive 15-inch-diagonal fullpage color display. It offers excel-lent focus, color quality, and maximum usable brightness. Has the ability to rotate 90 degrees between portrait and landscape orientations. Comes with a tilt/ swivel stand. Doesn't support 24bit color. Video card requires Mac II series, SE/30, or LC. Monitor only, \$1,995 (for Macs with builtin video); optional video card, \$795; 2-bit card for LC, \$395; 8bit upgrade kit, \$400. Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131. (800) 227-2795 or (408) 434-1010. (June '91)

Radius Full Page Display

The Radius Full Page Display is a bright monochrome portrait display, with screen resolution slightly below that of true WYSIWYG. It is capable of 256 shades of gray. A slight screen flicker is perceptible. Requires Mac Plus or later. \$895; SE or Classic monochrome board, \$295; LC monochrome board, \$395; 8bit gray-scale boards (LC, SE/30, II), \$795. Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131. (800) 227-2795 or (408) 434-1010. (Apr '90) ★ '86 Eddy Radius Pivot for Built-in Video

The Radius Pivot for Built-in Video is an impressive 15-inchdiagonal full-page display. Has excellent focus and maximum usable brightness. It's expensive but has the ability to rotate 90 degrees between portrait and landscape orientations. Comes with a tilt/ swivel stand. Video card requires Mac II series, SE/30, or LC. Monitor only, \$1,095 (for Macs with built-in video); optional video card, \$695; 2-bit card for LC, \$395; 8-bit upgrade kit, \$400. Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131. (800) 227-2795 or (408) 434-1010. (June '91)

Radius Two Page Display/19

The Radius Two Page Display/19

is a bright, well-focused 19-inch monochrome display system. Comes with Radius' famous software, which includes tear-off menus and screen capture. Requires Mac SE, SE/30, or II series. \$1,395. Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131. (800) 227-2795 or (408) 434-1010. (Apr '90) * '88 Eddy

Radius Two Page Display/21

\$\$\$\$%

This monitor's high pixel density may not offer perfect WYSIWYG, but it does display a lot of information. Its lack of glare protection is a trade-off in favor of maximum brightness. Excellent geometry. Linearity, focus, and lack-of-nuisance ratings above average. Requires Mac SE, SE/30, or II series. \$1,795. Radius, Inc., 1710 For-tune Dr., San Jose, CA 95131. (800) 227-2795 or (408) 434-1010. (Oct '90)

RasterOps ClearVue/GS tttt The ClearVue/GS gray-scale monitor has a flicker-free Ikegami tube. Its enormous virtual desktop and pan/zoom features provide flexibility. The screen gives good glare protection without reducing brightness. Excellent focus. Below-average linearity and geometry. Requires Mac II series. \$2,195. RasterOps, 2500 Walsh Ave., Santa Clara, CA 95051. (800) 729-2656 or (408) 562-

4200. (Oct '90)

RasterOps ClearVue/SE tttt/2 This 19-inch monochrome monitor is bright and very sharp with good focus. Screen is reasonably glare-free. Video card provides some acceleration for all Mac applications. Requires Mac SE. \$1,795. RasterOps, 2500 Walsh Ave., Santa Clara, CA 95051. (800) 729-2656 or (408) 562-4200. (Apr '90)

RasterOps ColorBoard 264

The ColorBoard 264 is a low-cost video board with 32-bit capability and good performance. One of the cheapest ways to get 16.7 million colors on your Mac. Requires Mac II series or SE/30, System 6.0.3 or later, and 32-bit QuickDraw. NuBus version, \$745; SE/30 version, \$895. RasterOps, 2500 Walsh Ave., Santa Clara, CA 95051. (800) 729-2656 or (408) 562-4200. (Feb '90)

RasterOps ColorBoard 364

The ColorBoard 364 is a dualpurpose NuBus board - a digitizing and display board as well as a 24-bit display card for the Apple 13-inch monitor. Good but limited software. Handles both video input and Mac interface. Digitizes video input with good image quality (8- or 24-bit). Video-in options include composite and Svideo. Live-video display can use a resizable 640-x-480-pixel, 24-bit window. Requires Mac II se-ries. \$1,295. RasterOps, 2500 Walsh Ave., Santa Clara, CA 95051. (800) 729-2656 or (408) 562-4200. (July '91) ★ '90 Eddy

Relax Ikegami Trinitron \$\$\$% This 20-inch color monitor is sharp but has annoying flicker and other electronic nuisances. Requires Mac II. \$2,199. Relax Technology, Inc., 3101 Whipple Rd., Ste. 22, Union City, CA 94587. (415) 471-6112. (May '90) Seiko Instruments 14" Color

(CM 1445) \$\$\$\$\%

This high-quality, 24-bit-color display system combines a Seiko Trinitron monitor with a RasterOps 264 24-bit-video card. A great value. The 14-inch-diagonal screen size may be large enough for some professional applications. The WYSIWYG display has standard 72-dpi pixel density. Complete controls are provided for screen-image brightness, contrast, vertical position/size, horizontal position/ size, and vertical/horizontal color convergence. Requires Mac II series. \$1,644. Seiko Instruments USA, Inc., 1130 Ringwood Ct., San Jose, CA 95131. (408) 922-5900. (May '91)

Sigma Designs PageView \$\$\$1/2

This full-page monochrome display screen offers multiple resolutions of 72, 80, and 88 dpi. Performance is good, but the price is high. You can also buy only the monitor and cable for the Mac IIsi and IIci. Comes with tilt/swivel stand and software. Requires Mac SE or later. \$1,199; monitor only for IIsi and IIci, \$899. Sigma Designs, 46501 Landing Pkwy., Fremont, CA 94538. (415) 770-0100. (Feb '91)

Sigma Designs SilverView

This 21-inch monochrome monitor is bright, with good focus and fair geometry. Minimal screennuisance factors. Horizontal-centering control. Good software. Requires SE, SE/30, or Mac II. \$1,999; with 8-bit card, \$2,399. Sigma Designs, 46501 Landing Pkwy., Fremont, CA 94538. (415)

770-0100. (Apr '90) SuperMac 19" Platinum Display tttt

This exceptional gray-scale display system has excellent focus, geometry, and lack-of-nuisance ratings. Above-average brightness and sharpness. Color-capable card. Hardware pan and zoom. Virtual desktop. Glare protection. Requires Mac II series. Monitor, \$1,399; 8-bit card, \$999. SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086. (408) 245-2202. (Oct '90)

SuperMac (Hitachi) 19" \$\$\$\$% This high-quality color display system combines a Hitachi monitor with a Spectrum/24 PDQ 24-bit-video card. It delivers excellent color quality, and the 19inch-diagonal screen size is large

enough for nearly all professional applications. The WYSIWYG display has standard 72-dpi pixel density. Few external controls are provided to manage screen-image characteristics. Requires Mac II series. \$6,799 list. SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086. (408) 245-2202. (May '91) SuperMac (Hitachi) 21"

This high-quality color display system combines a Hitachi monitor with a Spectrum/24 PDQ 24-bit-video card. It delivers excellent color quality, and the 21inch-diagonal screen size is large enough for professional applications. This near-WYSIWYG display has 77-dpi pixel density, so screen objects are slightly condensed. Few external controls are provided to manage screen-image characteristics. Requires Mac II series. \$8,399. SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086. (408) 245-2202. (May '91)

SuperMac (Sony) 19" tttt This high-quality color display system combines a Sony Trinitron monitor with a fast Series III 24bit video card. It delivers excellent color quality, and the 19-inchdiagonal screen size is large enough for nearly all professional applications. The very sharp WYSIWYG display has standard 72-dpi pixel density. Excellent software and a great value. Re-quires Mac II series. \$7,199. SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086.(408)245-2202.(May '91)

Taxan Crystal View 1111 This 19-inch monochrome monitor is bright and sharp but has poor subjective focus. Screen color is uneven with a yellowish center. Screen resolution is 72 dpi. \$1,695. Taxan, 161 Nortech Pkwy., San Jose, CA 95134. (408) 946-3400. (Apr '90)

INPUT DEVICES

Abaton 8-bit Apple Scanner Upgrade ttt

This upgrade greatly improves the gray-scale capabilities of the Apple Scanner, Requires Mac Plus or later and Apple Scanner, \$595. Abaton (Everex Systems), 48431 Milmont Dr., Fremont, CA 94538. (800) 444-5321 or (415) 683-2226. (Sept '90)

Abaton ProPoint \$\$\$%

The ProPoint has a click button and a small lock button on the lower left side of the trackball casing. Lefties may have to take their fingers off the ball to press the buttons. Requires Mac SE or later. \$140. Abaton (Everex Systems), 48431 Milmont Dr., Fre-mont, CA 94538. (800) 444-5321 or (415) 683-2226. (Oct '89)

Abaton Scan 300/GS \$\$\$% This 300-dpi monochrome scanner creates good halftone images. Nice software bundle. Requires Mac Plus or later. \$1,595. Abaton (Everex Systems), 48431 Milmont Dr., Fremont, CA 94538. (800) 444-5321 or (415) 683-2226. (Sept

Agfa Focus S800GS tttt

The Focus S800GS is a 400-dpi. 6-bit gray-scale scanner that simulates resolutions of up to 800 dpi. It has superior resolution and good halftone quality. Professional-quality software has extensive editing features and print-ing options. Users requiring 8-bit (256-gray) resolution will need Agfa's new Focus II S800GSE. Requires Mac Plus or later and NC View software. \$3,995; NC View software, \$495. Agfa Compugraphic, 200 Ballardvale St., Wilmington, MA 01887. (800) 227-2780 or (508) 658-5600. (June '89) * '88 Eddy

Agfa Focus II S800GSE tttt/2 This 8-bit gray-scale-only flatbed scanner has high resolution and intuitive software. Also has excellent optional software. Requires Mac Plus or later and NC View software. \$5,495; NC View software, \$495. Agfa Compugraphic, 200 Ballardvale St., Wilmington, MA 01887. (800) 227-2780 or (508) 658-5600. (Sept '90)

Apple Scanner ttt/2

The Apple Scanner is not a state of the art unit but is adequate for scanner neophytes. The 4-bit (16 gray level) scanner comes with AppleScan software and Hyper-Scan, written by Bill Atkinson. Requires System 6.0.3 or later, appropriate SCSI cables, and a hard-disk drive. \$1,799. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Sept

Asher Engineering quadLYNX Trackball \$\$\$1/2

The quadLYNX Trackball has an encased trackball. Small size makes it easy to control. Requires some wrist movement to access the buttons. Comes in both ADB and non-ADB versions. Requires Mac 512K or later, \$99.95. Asher Engineering, 15115 Ramona Blvd., Baldwin Park, CA 91706. (800) 321-5969 or (818) 962-063. (Oct '89)

Barneyscan CIS 3515 ttt

This slide scanner is easy to set up and has short scan times. Excellent software. Difficult manual focus. Image preview is in gray scale, not color. Unit requires regular calibration. Requires Mac II series for color work. \$4,495. Barneyscan Corp., 1125 Atlantic Ave., Alameda CA 94501. (415) 521-3388. (Sept '90) CalComp DrawingBoard

2300A ttt/ The CalComp 2300A is a fullfeatured drawing tablet that lets you resize and reposition the drawing area. Six different input devices (pens and pucks) and several software templates are available. AE Template Manager lets you perform all the System and HyperCard menu functions on the tablet. Requires Mac SE or II series. \$495 to \$2,995, depending on size. CalComp, 2411 W. La Palma Ave., Anaheim, CA 92801. (800) 225-2667 or (714) 821-2000. (Oct '89)

Chinon DS-3000 ### This 300-dpi scanner has poor resolvability. Good OCR, Ambient lighting is troublesome. Inexpensive but slow. Requires Mac Plus or later. \$895. Chinon, Inc., 660 Maple Ave., Torrance, CA 90503.(213)533-0274.(Sept '90) Complete PC Half-Page

Scanner/400 ttt/

This hand-held scanner has very good resolution. True 400-dpi scans. Excellent OCR. Requires Mac Plus or later, \$399. Complete PC, 1983 Concourse Dr., San Jose, CA 95131. (800) 634-5558 or (408) 434-0145. (Sept '90)

Felix ttt/2

The Felix is a 5.75-inch-square fixed-base mouse replacement. Space saver but awkward for lefties. Has a button on top of the pointer handle for mouse clicks. Has drawing setting for precise absolute movement. Software provides useful tools. Mac Plus and ADB versions available. Requires Mac Plus or later. \$169. ALTRA Technology, 1200 Sky-line Dr., Laramie, WY 82070. (800) 726-6153 or (307) 745-7538. (Oct '89)

FreeWheel Pointer \$\$\$\% The FreeWheel Pointer uses a pointer to determine the user's head position by bouncing infrared light off a small, lightweight mirror on the user's forehead. Has compact receiver unit and puff switch (can be mounted wherever convenient). Also includes software. Standard keyboard arrangement is located on-screen. Requires Mac Plus or later. \$1,395; ADB adapter for Mac SE, SE/30, and II series, \$150. Pointer Systems, Inc., One Mill St., Burling-ton, VT 05401. (800) 537-1562 or (802) 658-3260. (Oct '89)

GTCO MacIntizer ADB \$3\$ The MacIntizer compares favorably with other tablets in terms of mouse emulation and drawing but lacks some software features. No built-in capability for using or creating overlay templates. Provides developer stacks for HyperTalk and Pascal. Active area resized through control panel. HyperCard-stack documentation. Requires Mac SE, SE/30, or II series. \$495. GTCO Corp., 7125 Riverwood Dr., Columbia, MD 21046. (800) 344-4723 or (301) 381-6688. (Oct '89)

HeadMaster \$\$\$1/2 The HeadMaster is designed for users who have little or no use of their hands. It uses ultrasound signals emitted from a headset to

determine the position of the user's head. Has a puff tube for the mouse button. Emulates all mouse functions. Offers a variety of on-screen keyboards. Available for Mac 512K, Plus, SE, and II. Requires on-screen keyboard software such as Apple's Screen Keys; Mac SE or later requires ADB adapter. \$945; ADB adapter, \$150; Screen Keys, \$100. Prentke Romich Co., 1022 Heyl Rd., Wooster, OH 44691. (800) 262-1984 or (216) 262-1984. (Oct '89)

Hewlett-Packard ScanJet Plus

This 300-dpi flatbed scanner is fast and easy to use. Excellent, intuitive software. Requires Mac Plus or later. \$2,190 with Mac interface. Hewlett-Packard Co., 19091 Pruneridge Ave., Cupertino, CA 95014. (800) 752-0900 or (408) 725-8900. (Sept '90)

Howtek Scanmaster 1111 This color flatbed scanner is very large and slow. Scans at up to 300 dpi. Has powerful color controls in software. Poor OCR. Requires Mac II series with color monitor. \$8,195. Howtek, 21 Park Ave., Hudson, NH 03051. (603) 882-5200. (Sept '90)

Kensington Microware Turbo Mouse ADB \$\$\$\$\$

The Turbo Mouse ADB trackball lets you reverse mousing and locking functions for left-handed people. Has a chording feature for user-specified keyboard-command-equivalent functions. Requires Mac SE or later. \$169.95; Turbo Mouse Plus version (same price) for earlier Macs. Kensington Microware Ltd., 251 Park Ave. S., New York, NY 10010. (800) 535-4242 or (212) 475-5200. (Oct

Kurta IS/ADB \$\$\$\$

The IS/ADB tablet comes in three sizes and has a choice of seven pointing devices, including multibutton pucks and multibutton styli. Operates in either absolute or relative modes; active-area resizing on menu is handy for intensive drawing work. Has 12 function keys, good for creating macros. Requires Mac SE or later. \$495 to \$965. Kurta Corp., 3007 E. Chambers St., Phoenix, AZ 85040. (800) 445-8782 or (602) 276-5533. (Oct '89)

Kurta IS/ONE \$\$\$% The IS/ONE tablet with Penworks software lets you use a corded or cordless pen or mouse and a highres tablet for precise graphics input. Minor bugs with some ap-plications and DAs. Keystroke macros can be launched from the tablet. Minimal documentation. Requires Mac Plus or later. \$545 to \$995. Kurta Corp., 3007 E. Chambers St., Phoenix, AZ 85040. (800) 445-8782 or (602) 276-5533. (Jan '88)

Logitech ScanMan Model 32

This hand-held scanner has poor

dither. Scans at up to 400 dpi. Removable internal termination in SCSI box. Requires Mac Plus or later. \$499. Logitech, 6505 Kaiser Dr., Fremont, CA 94555. (415) 795-8500. (Sept '90)

Mac 'N Touch 1111

Mac 'N Touch is a touch screen that's useful for applications that require a lot of pointing and clicking. Doesn't work as well for programs that require fine control, such as graphics packages. Available as an add-in screen for Mac SE and II models and as a snap-on screen for the SE only. Preassembled touch screens are available for many sizes of Maccompatible monitors. SE add-in, \$745; Mac II add-in, \$895; SE snap-on, \$595. MicroTouch Systems, Inc., 55 Jonspin Rd., Wilmington, MA 01887. (508) 694-9900. (Oct '89) Mac-101 \$\$\$\$

The Mac-101 is an expanded keyboard. Has a keypad, 15 function keys, and more. The 101-Keys DA lets you define macros. Good feel and response. ADB versions available, \$194.95. DataDesk International, Inc., 9330 Eton Ave., Chatsworth, CA91311. (800) 826-5398 or (818) 998-4200. (Apr '88) Mac-105 ADB Extended

Keyboard \$\$\$%

The Mac-105 ADB Extended Keyboard is a good alternative to Apple's Extended Keyboard, with a larger Return key, larger and more-sculpted key tops, and a lower overall weight. Requires SE or Mac II series. \$159; with QuicKeys, \$189. Cutting Edge, 97 S. Red Willow Rd., Evanston, WY 82930. (307) 789-0582. (Feb

Mach IV Plus \$\$\$ 1/2

The Mach IV Plus has buttons on either side and one atop the joystick. Can be used as a mouse emulator. Comes in ADB and non-ADB models. Also available is a peripheral called Mirage that adapts earlier non-ADB CH joysticks for ADB use. Requires Mac SE or later for ADB version. Mach IV Plus, \$89.95; Mirage, \$54.95. CH Products, 970 Park Center Dr., Vista, CA 92083. (800) 624-5804 or (619) 598-2518. (Oct '89)

McIntyre \$\$\$%

McIntyre combines two products: a joystick for people who can't use their hands and WordWriter software. The LipStick joystick is held in the mouth, and clicking requires pressing a button on the top of the stick with the tongue. Joystick can also be mounted on a gooseneck stand. An image of the keyboard appears on-screen so users can select letters and carry out most keyboard functions. Extremely sensitive. WordWriter software, \$100; LipStick joystick, \$250. McIntyre Computer Systems, 22809 Shagbark, Birmingham, MI 48010. (313) 645-5090.

MicroSpeed MacTRAC ttt/2

The MacTRAC has three buttons a lock and two clicks cated above the trackball. Equal ease of use for right- or left-handed people. Light indicator signals that the lock button has been pushed. ADB version requires Mac SE or later, \$99; ADB version, \$119. MicroSpeed, Inc., 44000 Old Warm Springs Blvd., Fremont, CA 94538. (800) 232-7888 or (415) 490-1403. (Oct '89)

Microtek MSF-300GS ttt%

This 300-dpi scanner has nice software. Can process legal-sized documents. Requires Mac Plus or later. \$2,195. Microtek Lab, 680 Knox St., Torrance, CA 90502. (213) 321-2121. (Sept '90) Microtek MSF-300Z \$\$\$\$

This color scanner has nice software but delivers mediocre OCR. Separate DAs for color and blackand-white. Requires Mac SE/30 or II series. \$2,695. Microtek, 680 Knox St., Torrance, CA 90502. (213) 321-2121. (Sept '90) ★ '89 Eddy

Mouse Systems Little Mouse ***

The Little Mouse uses infrared light reflected from a special pad to track mouse movement. Compact, with no moving parts. Relative movement and clicking action feel similar to those of the standard Mac mouse. Improved precision for small objects. Must use included mouse pad. ADB version includes NuPaint 1.0 and requires Mac SE or later. Non-ADB version, \$99.95; ADB version, \$129.95. Mouse Systems Corp., 47505 Seabridge Dr., Fremont, CA 94538. (415) 656-1117. (Oct '89)

MouseStick \$\$\$\$\\\^2

The MouseStick is a joystick with programmable settings. Buttons can be programmed to do mousetype functions or execute keyboard commands with single-, double-, or triple-clicking. \$99.95. Advanced Gravis Computer Technology, Inc., 7400 MacPherson, Ste. 111, Burnaby, British Co-lumbia V5J 5B6, Canada. (604) 434-7274. (Oct '89)

MouseTouch \$\$\$\$

The Mouse Touch is a touch screen that permits pulling down menus and entering numeric information via an on-screen keypad. Can be user-installed. Requires Mac II series. For 12-to 14-inch monitor. \$895; for 19-inch monitor, \$1,010. Information Strategies, Inc., 888 S. Greenville Ave., Ste. 121, Richardson, TX 75081. (214) 234-0176. (Oct '89)

NCL America ClearScan ttt

This color hand-held scanner is not as advanced as black-andwhite scanners. Narrower scan width. Scans up to 90 dpi. Unsophisticated software. Resolution is inferior to gray-scale hand-held scanners and flatbed color scanners. Software is easy to use and

includes features that help deal with color. Requires Mac II or SE/ 30 with 8-bit-color card and monitor. \$695. NCL America Computer Products, 1221 Innsbruck Dr., Sunnyvale, CA 94089. (408) 734-1006. (Sept '90)

Nikon LS-3500 \$\$\$\$\% This slide scanner needs friendlier software, but it wins overall for resolution flexibility and for the wide range of controls offered. Focusing and calibration are automatic. High resolution and offers variable input resolution. Powerful software, not for novices. Requires Mac II series with 2 MB of RAM. \$9,995 (GPIB board not included). Nikon, 1300 Walt Whitman Blvd., Melville, NY 11747. (800) 645-6687 or (516) 547-4200. (Sept '90) PC Scan 2000 \$\$\$\$\\\^2\)

The PC Scan 2000 is an 8-bit sheet-fed scanner that saves images in up to 256 levels of gray. Can be configured for PCs. Publish Pac version 3.01 shipping. Requires Mac Plus or later and System 6.0.3 or later. \$1,395; bundled with Publish Pac and Recognize! OCR software, \$2,040; Publish Pac software, \$395. DEST, 1015 E. Brokaw Rd., San Jose, CA 95131. (408) 436-2700. (Dec '88) PC Scan 3000 \$\$\$\$

This flatbed scanner has the best 300-dpi resolvability of those tested by MacUser Labs. It has very even illumination and 8-bit gray-scale capability. Requires Mac Plus or later. \$1,395; bundled with Publish Pac and Recognize! OCR software, \$2,040; Publish Pac software, \$395. DEST, 1015 E. Brokaw Rd., San Jose, CA 95131. (408) 436-2700. (Sept '90)

Personal Writer PW 10SL

The PW 10SL is a drawing tablet that offers friendly software setup and easy macro programming. Basic menu commands, a mousing area, software controls, a macro pad, and a small keyboard appear along one side. Provides click-and-drag scaling and movable drawing area. \$799 to \$2,499. Personal Writer, Inc., 1900 Avenue of the Stars, Ste. 2870, Los Angeles, CA 90067. (800) 322-4744 or (213) 556-1001. (Oct '89)

Pocket WristMac #### The Pocket WristMac is a small watch that hooks to your Mac. You can download and retrieve up to 80 screens of 12 characters each. Options allow two-way communications. Excellent software. Hard to access data. Version 1.2 reviewed. Version 2.0 shipping. Requires Mac Plus or later and HyperCard. \$195. Microseeds Publishing, Inc., 5801 Benjamin Ctr. Dr., Ste. 103, Tampa, FL 33634. (813) 882-8635. (Dec '89)

PowerKey \$\$\$\$%

The PowerKey is a well-made

add-on device that starts SEs and SE/30s with a power key. Included software lets you program future timed events such as turning on the Mac or sending a specified keystroke combination. The actual power-key hardware has four surge-protected sockets. Version 1.0 reviewed. Requires SE or SE/ 30. \$99. Sophisticated Circuits, 19017 120th Ave. N.E., Ste. 106, Bothell, WA 98011. (206) 485-

7979. (Sept '90) Sharp JX-100 \$\$\$%

This inexpensive flatbed color scanner is small with good resolvability. Low resolution. Scans to RAM only. Requires Mac II series with at least 4 MB of RAM. \$995. Sharp Electronics, Sharp Plaza, Mahwah, NJ 07430. (201) 529-8200. (Sept '90) Sharp JX-300 \$\$\$\\\^2\$\\^2\$

This color scanner scans to RAM only. Very realistic color. GPIB interface difficult to figure out. Requires Mac II with at least 2 MB of RAM. \$2,345. Sharp Electronics, Sharp Plaza, Mahwah, NJ 07430. (201) 529-8200. (Sept '90)

Switchboard \$\$\$\$\$

The Switchboard was the first customizable keyboard. Comes with three standard modules: a cursor keypad, a numeric keypad, and a QWERTY alphanumeric keyboard. Key movement feels comfortable, and action is smooth. Can be configured via DIP switches to run with Macs or PCs. Many customizable settings. \$239.95. DataDesk International, Inc., 9330 Eton Ave., Chatsworth, CA 91311. (800) 826-5398 or (818) 998-4200. (Nov '90)

ThunderScan Plus tttt The ThunderScan was the original Mac scanner. It still does the job, albeit slowly. Can scan only materials that can be fed through a printer. Excellent software. Can scan up to 32 levels of gray. Scanned images are bit-mapped but can also be saved as PostScript files. Version 1.0.5 shipping. Requires Mac Plus or later and ImageWriter or ImageWriter II; requires separate power supply for use with Mac II series. \$249. Thunderware, Inc., 21 Orinda Way, Orinda, CA 94563. (800) 445-1166 or (415) 254-6581. (Mar '90) ★ '85 Eddy Thunderware LightningScan

400 \$\$\$\$%

This hand-held gray-scale scanner combines good hardware performance and excellent software. Scans at up to 400 dpi. Snap-on guide. Externally terminated SCSI box. Requires Mac Plus or later. \$495. Thunderware, Inc., 21 Orinda Way, Orinda, CA 94563. (800) 445-1166 or (415) 254-6581. (Sept '90)

Truvel TZ-3 \$\$\$\$%

This scanner has up to 900-dpi resolution. Has the ability to resolve 14 line pairs per millimeter, with superior halftone output and

the ability to handle large documents. Uneven illumination at edges. Scans only to available RAM. Requires Mac Plus or later with at least 2 MB of RAM. \$7,785. Truvel, 8943 Fullbright Ave., Chatsworth, CA 91311. (818) 407-1031. (Sept '90)

UMAX UG80 \$\$\$%

This 300-dpi flatbed scanner has excellent resolvability and gray scale. Convenient and easy to maintain. Requires Mac Plus or later with at least 2 MB of RAM; gray scale requires II series with 8- or 24-bit-video card, \$1,595. UMAX Technologies, 2352 Walsh Ave., Santa Clara, CA 95051. (800) 562-0311 or (408) 982-0771. (Sept '90)

Varityper 1200 tttt

High-resolution, 400-dpi, expensive scanner with excellent OCR capabilities. Powerful software controls. Price includes Mac IIx. Requires Mac IIx with at least 8 MB of RAM. \$29,000. Varityper, 11 Mt. Pleasant Ave., East Hanover, NJ 07936. (201) 887-8000. (Sept '90)

Wacom SD-510C Cordless

Digitizer \$\$\$\$ The SD-510C Cordless Digitizer is light and thin. Uses a pressuresensitive stylus requiring neither a cord nor a battery. Tablet connects to the modem port. Sensing area is 6 x 9 inches (roughly 10 x 13 inches overall). Resolution is 770 lines per inch with high accuracy. Much more responsive than a mouse. When not in use, makes an excellent mouse pad, Includes Pressure Paint program and choice of stylus or cursor. Requires Mac Plus or later. \$695. Wacom, Inc., W. 115 Century Rd., Paramus, NJ 07652. (800) 922-6613 or (201) 265-4226. (Jun '90)

OUTPUT DEVICES

Abaton LaserScript ***

The LaserScript is a slow per-sonal printer with a TEC laser engine. It uses a PostScript-clone system from Bauer and has 35 built-in Bitstream fonts. Its consumables setup is complex, because toner, developer, and drum units are separate. \$2,995. Abaton (Everex Systems), 48431 Milmont Dr., Fremont, CA 94538. (800) 444-5321 or (415) 683-2226. (Mar '91)

Apple LaserWriter IINT \$\$\$ Until the arrival of Apple's personal-laser-printer series, the LaserWriter IINT was Apple's midpriced PostScript laser printer. It's faster than the LaserWriter Plus and prints blacker blacks, but its gray-scale quality is less than that of the Plus. Apple's standard laser printer, it comes with toner cartridge and envelope cassette. Solid and reliable but beginning to show its age in price and per-formance. \$3,999. Apple Com-puter, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 7762333 or (408) 996-1010. (Oct '90)

Apple LaserWriter IINTX ttt This laser printer is one of the best for price and performance. Its 68020 chip makes it very speedy. Memory is expandable to 12 MB; a SCSI hard-disk drive can be attached to hold printer fonts and boost performance further. Comes with toner cartridge and envelope cassette but lacks paper-feed options. \$5,999. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Oct '90)

Apple Personal LaserWriter

NT \$355
This PostScript personal laser printer prints complex graphics files slowly but is very easy to set up. The toner and drum come in a single sealed cartridge. The Personal LaserWriter NT uses a Canon laser engine, has 37 builtin Adobe fonts, and has a 250sheet paper tray. A PIC chip gives this printer a speed advantage with AppleTalk-intensive applications. \$2,599. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Mar '91) CoStar LabelWriter \$35

The LabelWriter is a small serial printer that thermally prints individual labels. Labels can include bar codes but can't mix text and graphics. The interface needs some work. A timesaving device. Comes with two Casady & Greene fonts. Requires Mac Plus or later; special version available for Mac 512K and 512Ke. \$249.95. CoStar Corp., 22 Bridge St., Greenwich, CT 06830. (800) 426-7827 or (203) 661-9700. (May '90) Dataproducts LZR 1260i

\$\$\$\$%

This PostScript laser printer is one of the fastest printers for text and spreadsheets. Versatile and feature-laden. Good for both personal and corporate environments. \$5,995. Dataproducts, 6219 DeSoto Ave., Woodland Hills, CA 91365. (818) 887-8000. (Oct '90)

Diconix M150 Plus tttt

The Diconix M150 Plus printer is a tiny inkjet printer. Runs on bat-teries or AC and fits easily in a briefcase, Doesn't offer PostScript but comes with ATM. Requires Mac Plus or later. \$699. Diconix (Eastman Kodak Co.), PPP Customer Information Center, 901 Elm Grove Rd., Rochester, NY 14653. (800) 344-0006. (Sept '90)

Fujitsu RX-7100PS+ *** This PostScript laser printer has above-average performance. Has two paper bins. Nice software. \$3,790. Fujitsu America, Inc., 3055 Orchard Dr., San Jose, CA 95134. (800) 626-4686 or (408) 432-1300. (Oct '90)

GCC Business LaserPrinter II

The Business LaserPrinter II is a true Adobe PostScript printer with a low price. Its SCSI port lets you

attach a hard-disk drive for font storage. Speed is good (four pages per minute) considering the slow engine type. Bundled with QuickEnvelope. The BLP II uses an Okidata LED engine, has 35 built-in Adobe fonts, and has a 200-sheet paper tray. This printer is noisy but goes into Sleep mode when left idle. \$2,399. GCC Technologies, Inc., 580 Winter St., Waltham, MA 02154. (800) 422-7777 or (617) 890-0880. (Mar

GCC Business LaserPrinter IIS

The Business LaserPrinter IIS is a true Adobe PostScript printer with a low price. Its SCSI port lets you attach a hard-disk drive for font storage. Printing speed is a brisk eight pages per minute. Bundled with QuickEnvelope. It uses an Okidata LED engine, has 35 builtin Adobe fonts, and comes with a 200-sheet paper tray. This printer is noisy but goes into Sleep mode when left idle. \$2,899. GCC Technologies, Inc., 580 Winter St., Waltham, MA 02154. (800) 422-7777 or (617) 890-0880. (Mar '91)

GCC Personal LaserPrinter II

The PLP II is a 300-dpi Quick-Draw laser printer. Bargainpriced. Excellent printing performance, although a bit slow. No PostScript support. Requires Mac Plus or later. \$1,399. GCC Tech-nologies, Inc., 580 Winter St., Waltham, MA 02154. (800) 422-7777 or (617) 890-0880. (Mar '90) '89 Eddy

GCC Personal LaserPrinter IIS

(PLP IIS) \$\$\$\$\\\^2\$ The PLP IIS is a fast QuickDraw printer with high image quality. Sturdy. Its clever Sleep mode minimizes noise. Setup is a bit of a challenge. Has nice bundled software and outline fonts. Can be upgraded to PostScript. \$1,899. GCC Technologies, Inc., 580 Winter St., Waltham, MA 02154. (800) 422-7777 or (617) 890-0880. (Nov '90) ★ '89 Eddy GCC WriteImpact \$\$\$\$

The WriteImpact is a near-letterquality dot-matrix printer. Driver features include 25-to-400 percent enlargement and reduction, smoothing, print preview, and kerning. Uses special Bitstream fonts that tend to be large but also works well with ATM. Performance is very good. Version 1.01 (driver) shipping. Requires Mac Plus or later and a hard-disk drive. \$699. GCC Technologies, Inc., 580 Winter St., Waltham, MA 02154. (800) 422-7777 or (617) 890-0880, (Jun '90) Hewlett-Packard ColorPro

Graphics Plotter 111

The ColorPro Graphics Plotter is an eight-pen desktop plotter that requires third-party software to drive it. Fonts are limited to an optional Graphics Enhancement Our Package Is More Than A Box.

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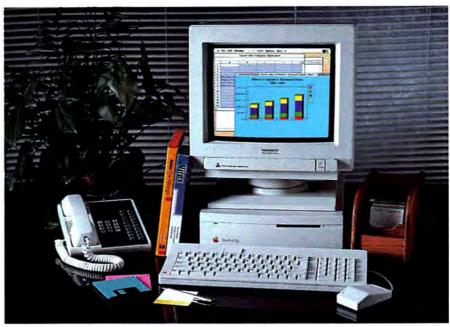
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Cartridge that requires some BA-SIC programming. \$1,295. Hewlett-Packard Co., 19091 Pruneridge Ave., Cupertino, CA 95014. (800) 752-0900 or (408) 725-8900. (Feb '88)

Hewlett-Packard DeskWriter

The HP DeskWriter is a Quick-Draw printer that doesn't compete with toner-based printers, because of its inkjet technology. If you print only a few letters a day, the price/performance ratio is almost unbeatable. Lightweight and compact size. Good manual. \$995. Hewlett-Packard Co., 19091 Pruneridge Ave., Cupertino, CA 95014. (800) 752-0900 or (408) 725-8900. (Nov '90)

Hewlett-Packard LaserJet III

This laser printer is too slow for most PostScript printing. Excellent text rendition. Requires LocalTalk interface. \$2,395; AppleTalk interface, \$275; PostScript option, \$695. Hewlett-Packard Co., 19091 Pruneridge Ave., Cupertino, CA 95014. (800) 752-0900 or (408) 725-8900. (Oct 1001

Hewlett-Packard LaserJet IIP

The HP LaserJet IIP, when configured as an Adobe PostScript printer, is slow and relatively expensive. Has a 50-sheet standard paper tray (an optional 250-sheet tray is available). Configuration can be difficult, because the manual lacks clear instructions about installing the PostScript cartridge, the LocalTalk card, and extra 2MB of RAM. \$2,195; 250sheet paper tray, \$195. Hewlett-Packard Co., 19091 Pruneridge Ave., Cupertino, CA 95014. (800) 752-0900 or (408) 725-8900. (Mar '91'

Hewlett-Packard PaintJet \$\$\$ This inexpensive inkjet printer is slow, with entry-level print quality. Limited color range with all colored inks in one cartridge. Separate power supply. Requires Mac PrintKit. \$1,395; Mac Print-Kit, \$125. Hewlett-Packard Co., 19091 Pruneridge Ave., Cupertino, CA 95014. (800) 752-0900 or (408) 725-8900. (May '90)

Hewlett-Packard PaintJet XL

The HP PaintJet XL is a fast inkjet printer with low-resolution QuickDraw (180-dpi) quality but produces good-looking output. Can't reproduce all colors. Paper handling is good, and it can print B-sized sheets. Requires Mac PrintKit. \$2,495; Mac PrintKit, \$125. Hewlett-Packard Co., 19091

The XL7700 continuous-tone color printer creates hard copy that looks as good as the original scanned photo. Although it's

pricey, the XL7700 establishes a new standard for color printing. By using dye sublimation, the printer blends colors between adjacent pixels to generate realistic images. The printer requires expensive color media. \$24,895. Eastman Kodak, 343 State St., Rochester, NY 14650. (800) 445-6325. (Jan '91) * '90 Eddy Kyocera Q-8010 \$\$\$

This PostScript-clone laser printer is fast with text but slow with graphics. Intelligent port and emulation switching. Limited by single paper tray with no options for envelopes or extra bins. Can receive data simultaneously through three active ports: serial, parallel, and LocalTalk. \$6,995. Kyocera Electronics, Inc., 1321 Harbor Bay Pkwy., Alameda, CA 94501. (800) 334-6056 or (415) 748-6680. (Oct '90)

Lasergraphics CPS ttt This thermal-wax-transfer printer is fast but has mediocre print quality. Has low resolution, with dpi of 203 (H) and 200 (V). Includes MacRascol. \$4,995. Lasergraphics, 20 Ada Ave., Irvine, CA 92718. (714) 727-2651. (May '90)

LaserMaster 1000 Personal Typesetter \$\$

This laser printer has compatibility problems. Image quality is not up to 1,000-dpi claim. Requires Mac II. \$7,995. LaserMaster Systems, 7150 Shady Oak Rd., Eden Prairie, MN 55344. (612) 944-9457. (Oct '90)

Mitsubishi S340-10 \$\$\$\$

This sublimal-dye-transfer printer creates excellent proofs. Superb print quality. Color range is limited, although the gradients are excellent. Would have received 4.5 mice if Mac interface had been included. \$13,995. Mitsubishi Electronics America, 991 Knox St., Torrance, CA 90502. (213) 217-5732. (May '90) NEC Colormate PS Model 80

Offering true PostScript, the Colormate PS Model 80 was the fastest thermal-wax-transfer color printer we tested for our May '91 lab report. Standard RAM configuration is 8 MB. Halftoning is poor, but overall image quality and color registration are good. The optional hard drive stores printer fonts and helps boost performance. \$8,995; optional 20-MB hard drive, \$995. NEC Technologies, Inc., 1414 Massachusetts Ave., Boxborough, MA 01719. (800) 632-4636 or (508) 264-8000. (May '91)

Océ OcéColor \$\$\$\$

Offering true PostScript, the OcéColor is a fast, compact thermal-wax-transfer color printer. Standard RAM configuration is 5 MB, upgradable to 8 MB. Halftoning is poor, but overall image quality is good. A SCSI port is included for use with thirdparty hard drives. Best quality when printing black type. \$8,990. Océ Graphics USA, Inc., 385 Ravendale Dr., Mountain View, CA 94039. (800) 545-5445 or (415) 964-7900. (May '91)

Okidata OkiLaser 840 ttt If you can afford the space for this large printer, it's a good choice. The OkiLaser 840 is among the fastest personal PostScript printers, with speed of up to eight pages per minute. It uses an Okidata LED engine, has 35 built-in Adobe fonts, and has a 200-sheet paper ray, \$2,999. Okidata, 532 Fellowship Rd., Mount Laurel, NJ 08054. (609) 235-2600. (Mar'91) QMS ColorScript 100

Model 10 \$\$\$% The ColorScript 100 Model 10 is the first four-color thermal-waxtransfer PostScript printer. Fast and simple to install and use. Excellent typographic capability. Standard RAM configuration is 5 MB, upgradable to 8 MB. A SCSI port is included for use with thirdparty hard drives. Overall image quality was worst among printers we tested for our May '91 lab report. \$8,995. QMS, Inc., One Magnum Pass, Mobile, AL 36618. (800) 523-2696 or (205) 633-4300. (May '91) ★ '89 Eddy

QMS-PS 410 \$\$\$\$%

The OMS-PS 410 is a personal Adobe PostScript printer. Al-though its engine makes it somewhat slow for printing plain text, its speed is superior for processorintensive applications such as printing complex graphics. It keeps all three data ports "live" at all times and features the ability to change emulations on the fly, without user intervention. A good choice for small offices with Macs and PCs. \$2,795. QMS, Inc., One Magnum Pass, Mobile, AL 36618. (800) 523-2696 or (205) 633-4300. (Mar '91) ★ '90 Eddy

QMS-PS 810 444/2

The QMS-PS 810 is an eight-pageper-minute 300-dpi PostScript laser printer that competes with the LaserWriter IINT. Comes with 2 megabytes of RAM, upgradable to 3 megabytes. \$3,995. QMS, Inc., One Magnum Pass, Mobile, AL 36618. (800) 523-2696 or (205) 633-4300. (July '88)

QMS-PS 810 turbo \$\$\$\$

This PostScript laser printer is faster than Apple's LaserWriter IINTX, and provides the same SCSI interface for a hard drive that stores print fonts. \$5,495. QMS, Inc., One Magnum Pass, Mobile, AL 36618. (800) 523-2696 or (205) 633-4300. (Oct '90) QMS-PS 820 turbo \$\$\$\$

The QMS-PS 820 turbo is a good substitute for the LaserWriter IINTX, producing equivalent output more quickly and at a slightly reduced cost. Has two paper trays, each for 200 sheets. Uses a Canon TX engine. Harddisk drive can be attached for fonts.

\$6,495. QMS, Inc., One Magnum Pass, Mobile, AL 36618. (800) 523-2696 or (205) 633-4300. (May '90)

Qume CrystalPrint Express

The bargain-priced CrystalPrint Express is the fastest PostScriptclone printer available. Based on a Weitek RISC microprocessor, this compact machine offers industrial-strength, high-capacity, networkable printing. Its 300-dpi output quality is good. The printer lacks the ability to read Adobe Type I PostScript fonts' built-in hinting; this is less of a problem if horizontal resolution is increased to 600 dpi (which requires the 6-MB configuration). There's no SCSI port to allow attachment of a hard-disk drive for storing type fonts. Two 250-sheet paper trays are standard. With 3 MB of RAM, \$5,595; with 6 MB of RAM, \$6,590. Qume Corp., 500 Yose-mite Dr., Milpitas, CA 95035. (800) 223-2479 or (408) 942-4000. (June '91)

Qume CrystalPrint Publisher \$\$\$\$%

The CrystalPrint Publisher was the first 300-dpi PostScript-clone printer. Based on a RISC microprocessor, it's faster and cheaper than the LaserWriter IINT. Output quality is excellent, but it can't handle Adobe fonts. Lacks manual feed or envelope capabilities. Requires Mac Plus or later. \$3,995. Qume Corp., 500 Yosemite Dr., Milpitas, CA 95035. (800) 223-2479 or (408) 942-4000. (Sept '89) * '88 Eddy

Seiko ColorPoint PS Model 4

Using PostScript emulation, the compact, low-priced Seiko ColorPoint PS Model 4 was the slowest thermal-wax-transfer color printer we tested for our May '91 lab report, Standard RAM configuration is 6 MB, upgradable to 34 MB. Overall image quality is good, and it has the largest scalable usable print area on letter-sized paper. Has SCSI port for use with third-party hard drives. Built-in fonts are from Bitstream. 90-day warranty, \$6,999. Seiko Instruments USA, Inc., 1130 Ringwood Ct., San Jose, CA 95131.(408)922-5900.(May '91)

Seiko Instruments CH-5504

This thermal-wax-transfer printer has good color range but poor line resolution on transparencies. Compact but slow. Has large usable print area. Includes Adobe Type Manager, Plus Pack, and TypeAlign. \$7,000. Seiko Instruments USA, Inc., 1130 Ringwood Ct., San Jose, CA 95131. (408) 922-5900. (May '90) Seiko Smart Label Printer

The Smart Label Printer is a small serial printer that thermally prints labels one at a time. Labels can

MICE RATINGS \$ 1/2 \$ 15/2 \$

include bar codes but can't mix text and graphics. The interface needs some work. Requires Mac Plus or later. \$249.95. Seiko Instruments USA, Inc., 1130 Ringwood Ct., San Jose, CA 95131. (408) 922-5900. (May '90)

Sharp JX-730 Color Ink Jet

This inkjet printer is slow, with mediocre print quality. Color range is good. Takes hand-fed paper only. Does not print transparencies. Annoying noise and vibration. \$2,195. Sharp Electronics, Sharp Plaza, Mahwah, NJ 07430. (201) 529-8200. (May '90) Shinko CHC-345 ttt

This thermal-wax-transfer printer has excellent image quality but is slow, with poor line resolution on transparencies. Limited color range. \$6,000. Mitsubishi International Corp., 701 Westchester Ave., White Plains, NY 10604. (914) 997-4999. (May '90) Tektronix 4693DX Color

Image Printer \$\$%

The Tektronix 4693DX Color Image Printer is a 300-dpi color printer that produces bit-mapped images. Colors look smooth and rich. Uses bit-mapped screen fonts; most type has noticeable jaggies. Optional connection to four Macs. Requires Mac Driver Kit (8-MB configuration recommended). 8-MB configuration, \$8,995; Mac Driver Kit, \$295. Tektronix, Inc., P.O. Box 1000, MS#63-630, Wilsonville, OR 97070. (800) 835-6100. (May '90)

Tektronix ColorQuick \$\$\$\$ The ColorQuick is an inkjet QuickDraw printer with 216-dpi quality. Produces vivid colors and has excellent color range. It's fast and offers hand, roll, and cut-sheet paper feeds. Requires Mac interface kit. \$2,345; Mac interface kit, \$150. Tektronix, Inc., P.O. Box 1000, MS#63-630, Wilsonville, OR 97070. (800) 835-6100. (May '90)

Texas Instruments microLaser PS35 4444

The microLaser PS35 is a compact, easy-to-use, personal PostScript printer that outputs six pages per minute. It uses a Sharp laser engine, has 35 built-in Adobe fonts, and has a 250-sheet paper tray. Its high speed is due to efficient data handling and intelligent allocation of printer memory. Modular design simplifies upgrades. Excellent on-board help and diagnostics. A good choice when desk space is at a premium. \$2,849. Texas Instruments, Inc., P.O. Box 202230, Austin, TX 78720. (800) 527-3500. (Mar '91) Varityper VT600P \$255

This 600-dpi PostScript laser printer provides camera-ready output when less-than-Linotronic quality is acceptable. It produces excellent image quality. \$16,995. Varityper, 11 Mt. Pleasant Ave., East Hanover, NJ 07936. (201) 887-8000. (Oct '90) WriteMove \$\$\$

The WriteMove is one of the smallest, lightest Mac printers. It's an inkjet unit that produces reso-lutions of up to 192 dpi. Runs off expensive rechargeable batteries or AC. Weighs 3 pounds. Comes with a good selection of Bitstream fonts. Printing quality varies, depending on the paper and ink used. Driver version 1.0 reviewed. Version 1.3 shipping. Requires Mac Plus or later and a hard-disk drive. \$549. GCC Technologies, Inc., 580 Winter St., Waltham, MA 02154. (800) 422-7777 or (617) 890-0880. (Apr '89)

PERFORMANCE ENHANCERS

Aox DoubleTime-16 tttt

This accelerator offers a modest increase in performance. Simple installation. Good choice for tight budget. Requires Mac SE. Without FPU, \$395; with FPU, \$545. Aox, 486 Totten Pond Rd., Waltham, MA 02154. (800) 232-1269 or (617) 890-4402. (Aug

Apple Macintosh Ilci Logic Board Upgrade tttt

This acceleration option is a significant performance booster over the IIcx but requires 80-nanosec-ond or faster RAM SIMMs. Requires Mac IIcx. \$2,399. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Aug

Apple Macintosh Ilfx Upgrade

Apple's motherboard replacement boasts a 40-MHz CPU and outperforms other add-ons at reasonable cost. SRAM cache and fast DMA SCSI. Special IIfx RAM required (minimum 4 MB). This acceleration option provides allaround best performance for Mac II and IIx owners. Requires Mac II or IIx and 4 MB of DRAM. \$2,999. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or

(408) 996-1010. (Aug '90) Apple Macintosh SE/30 Logic Board Upgrade \$\$\$\$%

This acceleration option offers color QuickDraw and stereo sound features. Capability for 8 MB of RAM distinguishes it from other SE-accelerator options. Requires Mac SE (FDHD upgrade and System 6.0.5 software recommended).\$1,699; FDHD upgrade, 3449. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Aug '90)

DayStar 25MHz PowerCard 030 4444

This accelerator is a speedy upgrade for the Mac II, IIx, and IIcx. Comes with or without FPU. Requires Mac II, IIx, or IIcx; IIcx requires CPU-socket upgrade for soldered-in CPUs. \$1,699; IIcx

CPU-socket upgrade, \$49. DayStar Digital, Inc., 5556 Atlanta Hwy., Flowery Branch, GA 30542. (800) 962-2077 or (404) 967-2077. (Aug '90) DayStar 33MHz PowerCard

030 \$\$\$\$

This accelerator is a speedy up-grade for the Mac II, IIx, or IIcx. Good price and performance. Requires Mac II, IIx, or IIcx; IIcx requires CPU-socket upgrade for soldered-in CPUs. Without FPU, \$1,699; with FPU, \$1,999; IIcx CPU-socket upgrade, \$49. DayStar Digital, Inc., 5556 Atlanta Hwy., Flowery Branch, GA 30542. (800) 962-2077 or (404)

967-2077. (Aug '90) DayStar 40MHz PowerCard 030 \$\$\$\$

This accelerator is a speedy up-grade for the Mac II, IIx, or IIcx. Good price and performance. Requires Mac II, IIx, or IIcx; IIcx requires CPU-socket upgrade for soldered-in CPUs. Without FPU, \$1,899; with FPU, \$2,199; IIex CPU-socket upgrade, \$49. DayStar Digital, Inc., 5556 Atlanta Hwy., Flowery Branch, GA 30542. (800) 962-2077 or (404)

967-2077. (Aug '90) DayStar FastCache Ilci ‡‡‡‡‡ The FastCache IIci is a full-height cache card that fits into the IIci's processor-direct slot. The cache card has 64K of 25-nanosecond static RAM that increases the Ilci's overall performance by approxi-mately 30 percent. This speed booster is an economical, easy upgrade that requires no software. SANE patch provided for extra speed with some kinds of math computation; INIT/control panel provided allows cache disabling. Benchmark software is bundled. Requires Mac IIci. \$379. DayStar Digital, Inc., 5556 Atlanta Hwy., Flowery Branch, GA 30542. (800) 962-2077 or (404) 967-2077. (June '91)

Dove MaraThon 030/II ttt This accelerator's simple, small board has a 68030 CPU with twice the Mac II's normal speed. Memory cache must be disabled when you format floppy disks. Requires Mac II or IIx. \$899. Dove Computer Corp., 1200 N. 23rd St., Wilmington, NC 28405. (800) 622-7627 or (919) 763-7918. (Aug

Dove MaraThon 030/SE30 \$\$\$%

Simple, small, low-cost. Features 68030 with twice normal SE/30 clock speed. Memory cache must be disabled when you format floppy disks. Recommended for the SE/30. Can increase performance up to 40 percent. Requires Mac SE/30, \$899. Dove Computer Corp., 1200 N. 23rd St., Wilmington, NC 28405. (800) 622-7627 or (919) 763-7918. (Aug

Dove MaraThon MSE3 \$\$\$\$ This accelerator has a simple de-

sign with few components. Easy to install. Requires Mac SE. Without FPU, \$699; with FPU, \$999. Dove Computer Corp., 1200 N. 23rd St., Wilmington, NC 28405. (800) 622-7627 or (919) 763-7918. (Aug '90)

Dove MaraThon Racer tttt The MaraThon Racer accelerator is an inexpensive way to get better performance from a Mac II. It supplies a cache of 32K of high-speed static RAM that increases performance an average of 15 percent. Somewhat difficult to install, because the 68020 chip must be moved. Requires Mac II. \$259. Dove Computer Corp., 1200 \$259. Dove Computer Corp., 1200 N. 23rd St., Wilmington, NC 28405. (800) 622-7627 or (919) 763-7918. (Aug '90) iir Cache Card 32 \$\$\$\frac{1}{2}\$\frac{1}{2}\$ is a half-

height cache card that fits into the Mac Ilci's processor-direct slot. The cache card has 32K of 25nanosecond static RAM that increases the Ilci's overall performance by approximately 30 percent. This speed booster is an economical, easy upgrade requir-ing no software. Because no control-panel software is provided to allow cache disabling, if any software proves incompatible, the only option is to temporarily re-move the cache card. Requires Macintosh IIci. \$325. iir, 210 Dahlonegha, Cumming, GA 30130.(404)781-8643.(June '91) MacProducts '030 RailGun-25 MHz \$\$\$%

This accelerator has the same basic design as the Novy Quik30/ Plus-33MHz. Limited SCSI throughput (upgrade planned). Supported Macs are 128K, 512K, 512Ke, Plus, SE, and Classic. Without FPU, \$799; with FPU, 8303 Mopae Expy., Ste. 218, Austin,TX78759.(800)622-3475 or (512) 343-9441. (Aug '90)

Micron Xceed Ilci tttt The Xceed IIci is a full-height cache card that fits into the IIci's processor-direct slot. The cache card has 128K of 25-nanosecond static RAM that increases the IIci's overall performance by approximately 30 percent. This speed booster is an economical, easy upgrade requiring no software. SANE patch provided for extra speed with some kinds of math computation; INIT/control panel provided allows cache disabling. Benchmark and Fkeys software is bundled. Requires Mac IIci. \$329. Micron Technology, Inc., 2805 E. Columbia Rd., Boise, ID 83706. (800) 642-7661 or (208) 368-3800. (June '91)

Newer Technology MacSElerator \$\$\$\$

This SE accelerator offers good price/performance. Requires Mac SE. Without FPU, \$295; with FPU, \$505. Newer Technology, 1117 S. Rock Rd., Wichita, KS

67207. (800) 678-3726 or (316) 685-4904. (Aug '90)

Novy Systems Quik30/Plus-33MHz ttt/2

This accelerator gives Mac 512Ke, Plus, and SE owners Ilci computing power. Limited SCSI throughput. Requires Mac 512Ke, Plus, or SE. With 16-MHz FPU, \$1,294; without FPU, \$1,195. Novy Systems, 1862 Fern Palm Dr., Edgewater, FL 32141. (904) 427-2358. (Aug '90)

Orchid MacSprint II ttt

This accelerator is a good buy. Simple upgrade offers moderate performance increase for little money. There's a control panel that disables cache for incompatible software. Version 2.1 shipping. Requires Mac II. \$299. Orchid Technology, 45365 North-port Loop W., Fremont, CA 94538. (800) 767-2443 or (415) 683-0300. (Aug '90)

Radius Accelerator 16 SE \$\$\$\$1/2

The Radius Accelerator 16 SE is simple to install. Easy configuration via control panel or startup dialog box. Requires Mac SE. Without FPU, \$495; with FPU, \$695. Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131. (800) 227-2795 or (408) 434-1010. (Aug

Radius Accelerator 25 SE

The Radius Accelerator 25 SE has a 68882 FPU for fast number crunching. Easy configuration via control panel or dialog box. Requires Mac SE. \$1,295. Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131. (800) 227-2795 or (408) 434-1010. (Aug '90) Radius QuickCAD Graphics

Engine \$\$\$\$

The QuickCAD Graphics Engine is a NuBus card that increases the Mac's screen-redraw speed. Uses a 10-MHz RISC chip. Accesses integer display lists directly from AutoCAD 10c5 and VersaCAD 2.2. Benefits best realized with Radius monitors. Version 1.0 (ROM) and 1.1.1 (software) shipping. Requires Mac II series. \$1,495. Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131. (800) 227-2795 or (408) 434-1010. (Aug

Siclone Si3033 tttt

This accelerator is a speedy upgrade for the Mac II or IIx. Retains older CPU to allow downshift to native unaccelerated mode. INIT provided enables proper floppy operation. Requires Mac II or IIx. Without FPU, \$1,799; with FPU, \$1,999. Siclone Sales and Engi-

This accelerator is very fast. Expensive. INIT enables proper floppy operation. Requires Mac II or IIx. Without FPU, \$2,499;

with FPU, \$2,999. Siclone Sales and Engineering, 1072 Saratoga-Sunnyvale Rd., Bldg. A-107, Ste. 443, San Jose, CA 95129. (408)

Technology Works
Cache Card 64 \$\$\frac{1}{2} cache card that fits into the IIci's processor-direct slot. The cache card has 64K of 25-nanosecond static RAM that increases the IIci's overall performance by approximately 30 percent. This speed booster is an economical, easy upgrade requiring no software. SANE patch for extra speed with some kinds of math computation; INIT/control panel allows cache disabling. Requires Mac IIci. \$269. Technology Works, 4030 Braker Ln. West, Austin, TX 78759. (800) 688-7466 or (512) 794-8533. (June '91)

TMS Cache Card 64 1111 The TMS Cache Card 64 is a fullheight cache card that fits into the IIci's processor-direct slot. The cache card has 64K of 25-nanosecond static RAM that increases the IIci's overall performance by approximately 30 percent. This speed booster is an economical, easy upgrade requiring no software. SANE patch provided for extra speed with some kinds of math computation: INIT/control panel provided allows cache disabling. Requires Mac IIci. \$269. TMS Peripherals, 23123 S.W. 58th Ave., Boca Raton, FL 33428. (800) 626-6347 or (407) 482-

4034. (June '91) Total Systems Gemini 020 1111

This accelerator has complex installation. Recommended GemKit option speeds SCSI throughput on Plus. Can be upgraded to 68030. Cost-effective and speedy for Mac Plus. Requires Mac 128K, 512K Plus, or SE. SE version, \$745; SE version with FPU, \$935; Plus version, \$895; Plus version with FPU, \$1,045. Total Systems, 99 W. 10th Ave., Ste. 333, Eugene, OR 97401. (800) 874-2288 or

(503) 345-7395. (Aug '90) Total Systems Gemini 030

This accelerator has fast 68030/ 68882 chips and high clock speed. Complex installation. GemKit option speeds SCSI throughput on Plus. Can boost Plus performance past that of a IIci. Requires Mac 128K, 512K, Plus, or SE. Plus version, \$1,895; Plus version with FPU, \$2,395; SE version, \$1,695; SE version with FPU, \$2,195. Total Systems, 99 W. 10th Ave., Ste. 333, Eugene, OR 97401. (800) 874-2288 or (503) 345-7395. (Aug '90) Total Systems QuickCache Ilci

ttttt The QuickCache IIci is a fullheight cache card that fits into the IIci's processor-direct slot. The cache card has 128K of 25nanosecond static RAM that increases the IIci's overall performance by about 30 percent. This speed booster is an economical, easy upgrade requiring no software. SANE patch provided for extra speed with some kinds of math computation; INIT/control panel provided allows cache disabling. Benchmark and Fkeys software is bundled. Requires Mac Ilci. \$269. Total Systems, 99 W. 10th Ave., Ste. 333, Eugene, OR 97401. (800) 874-2288 or (503) 345-7395. (June '91)

UR Micro MacCache 64 tttt/2 The MacCache 64 is a full-height cache card that fits into the IIci's processor-direct slot. The cache card has 64K of 25-nanosecond static RAM that increases the IIci's overall performance by approximately 30 percent. This speed booster is an economical, easy upgrade requiring no software. INIT/control panel provided allows cache disabling. Requires Mac IIci. \$199. UR Micro, 1659 N. Forest Rd., Williamsville, NY 14221. (800) 876-4276 or (716) 689-1600. (June '91)

UR Micro MacCache LP32

The MacCache LP32 is a halfheight cache card that fits into the Ilci's processor-direct slot. The cache card has 32K of 25-nanosecond static RAM that increases the IIci's overall performance by approximately 30 percent. This speed booster is an economical, easy upgrade requiring no software. INIT/control panel provided allows cache disabling. Requires Mac IIci. \$189. UR Micro, 1659 N. Forest Rd., Williamsville, NY 14221, (800) 876-4276 or (716) 689-1600. (June '91)

STORAGE MEDIA & MEMORY

Apple Hard Disk 20SC ttt

The Hard Disk 20SC is Apple's 20-MB SCSI hard-disk drive. Reliable but fairly noisy unit. Good utility software. Requires SCSI Card. \$699. Apple Com-puter, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Dec '88) Apple Hard Disk 40SC tttt

The well-designed Hard Disk 40SC is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. If you like the reassurance of the Apple logo and its dealer network, you may not mind the high price. \$1,299. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, (800) 776-2333 or (408) 996-1010. (Apr '91)

Apple Hard Disk 80SC \$\$\$\$% The Hard Disk 80SC is a superbly designed and well-built 80-MB unit. Noisy. Runs warm. Automatic head parking. Zero footprint. Requires Mac Plus or later. \$1,799. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Feb '90)

Apple PC 5.25 Drive \$\$\$\% The Apple PC 5.25 Drive can read 5.25-inch DOS floppy disks. Unlike most Mac drives, it doesn't appear on the desktop. Access to DOS files is through AFE. Requires Mac SE or II, System 6.03 or later, and Mac SE-Bus or Mac II PC drive card. \$399; Mac SE-Bus or Mac II PC drive card, \$129. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Oct '89)

AppleCD SC \$\$\$1/2 This is the drive that started it all for Mac CD-ROM. Although expensive, it's well built and offers good - but not great - speed. It has good audio software. SCSI-ID selection is difficult via pinhole access. External SCSI termination. \$899. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or

(408) 996-1010. (June '91) **Applied Engineering** MacRAM Portable tttt/2

The MacRAM Portable is the first memory-expansion card for the Mac Portable. The card can hold from 1 to 8 MB of RAM and creates little additional drain on the battery, so you can open several applications at once without problems. The card even comes with a grounding wrist strap to prevent electrostatic damage to your Mac during installation. The most versatile way to upgrade memory in a Mac Portable. I-MB Mac Portable, \$399; each additional SIMM, \$350. Applied Engineering, 3210 Belt Line Rd., Dallas, TX 75234. (214) 241-6060. (Mar '91) APS 1 Gigabyte \$\$\$\$

The APS 1 Gigabyte hard-disk drive has an actual capacity of 988 MB and an average seek time of 15 milliseconds. Based on the Seagate ST41200NM mechanism. Provides good performance with the Alliance Power Tools 1.18 SCSI driver. SCSI-ID selection is via DIP switch, and SCSI termination uses an external plug. Has 18 MB of shareware. \$2,899. APS, 2900 S. 291 Hwy., Independence, MO 64057. (800) 233-7550 or (816) 478-8300. (July '91)

APS 40 MB Hard Drive ttt/2 The APS 40 MB is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. Performance is average. APS sells directly to the public, offering a good price and a large collection of bundled shareware. Unfortunately, this drive has internal SCSI termination and uses DIP switches to set the SCSI-ID number. \$399. APS, 2900 S. 291 Hwy., Independence, MO 64057. (800) 233-7550 or (816) 478-8300. (Apr '91)

APS 45 MB Removable ttt APS offers toll-free tech support

for this SyQuest drive, which comes with rudimentary documentation but lots of shareware. This drive's SCSI ID is changed viaexternal DIP switches. It comes with a cartridge that has a capacity of about 44 MB. SyQuest technology offers speed and compatibility with an industry standard. \$549; twindrive, \$999. APS, 2900 S. 291 Hwy., Independence, MO 64057. (800) 233-7550 or (816) 478-8300. (Feb '91)

Aristotle Hardpac 40 111

The Hardpac 40 is a 40-MB external SCSI hard drive based on the fast, reliable Quantum P40S mechanism. It is compact and inexpensive. It relies on power from the Mac's floppy-drive port not advisable with the Mac Classic. SCSI termination is internal. and SCSI-ID selection is via an external rotary switch. \$595. Aristotle Industries, 7400 Mac-Pherson, #111, Burnaby, British Columbia V5J 5B6, Canada. (604) 434-7274. (Apr '91)

ATTO SiliconDisk Pro 24

tttt/2

SiliconDisk Pro 24 is a large, highperformance, dedicated RAM disk with access times 300 times faster than an average hard-disk drive. Easy to hook up and use. Extremely fast for I/O-intensive applications. Performance for computation similar to that of hard drive. Data disappears when power is turned off. Expensive. Requires Mac Plus or later. \$3,995 to \$19,995, depending on capacity. ATTO Technology, 1576 Sweet Home Rd., Amherst, NY 14228, (716) 688-4259, (Feb '90) CD Technology Porta-Drive

*** This is a small and portable CD-ROM drive that is well built and

offers good performance. Has good audio software but limited volume control (upgrade to rotary switch planned). SCSI-ID selection is done via push wheel. External SCSI termination. On/off switch for external power supply. 8895. CD Technology, 780 Montague Expy., Ste. 407, San Jose, CA 95131. (408) 432-8698. (June '91)

Chinon CDA-431 \$555 Small and portable CD-ROM drive that is well built but offers mediocre speed. SCSI-ID selection is done via DIP switch. External SCSI-termination switch. \$795. Chinon, Inc., 660 Maple Ave., Torrance, CA 90503. (213) 533-0274. (June '91)

ClubMac 44 MB ttt

This SyQuest removable-cartridge drive has a quiet fan but is not very rigid. Has rudimentary documen-tation. Supports A/UX drive partitioning and includes good software, cables, and a cartridge. SyQuest technology offers speed and compatibility with an industry standard. It comes with a cartridge that has a capacity of about 44 MB. \$485. ClubMac, 7 Musick, Irvine, CA 92718. (800) 258-2622 or (714) 768-1490. (Feb '91)

CMS Enhancements MacStack SD45RM ttt

This SyOuest removable-cartridge drive comes with excellent documentation and has an autoswitching power supply. The cartridge has a capacity of about 44 MB. The extended warranty is optional. This drive's SCSI ID can be changed via external DIP switches. SyQuest technology offers speed and compatibility with an industry standard. \$999; extended warranty, \$119 a year. CMS Enhancements, 2722 Michelson Dr., Irvine, CA 92715. (714) 222-6000. (Feb '91)

CMS PD1000S ****

The CMS PD1000S is a 1-gigabyte expensive hard-disk drive with an actual capacity of 886 MB. Has an average seek time of 15 milliseconds. Based on the Micropolis 1598-15 mechanism. Provides good performance with the CMS Utility 6.0.1 SCSI driver. SCSI-ID selection is via external button. and SCSI termination uses an external plug. Bundled with Symantec Utilities for the Macintosh. \$7,199. CMS Enhancements, 2722 Michelson Dr., Irvine, CA 92715.(714)222-6000.(July '91)

CMS Platinum 40 MB \$\$\$\% The CMS Platinum 40 MB is a 40-MB external SCSI hard-disk drive based on the slow, older (but reliable) Conner CP3040 mechanism. For the price, this drive has poor performance and a stark design, but it includes an autosensing power supply for use with North American or European voltages. Good software is bundled, including SUM II. SCSI termination is internal, which makes daisy-chaining SCSI de-vices difficult. \$919. CMS Enhancements, 2722 Michelson Dr., Irvine, CA 92715. (714) 222-6000. (Apr '91) CMS Platinum Series PD 300

The CMS Platinum Series PD 300 is a hard-disk drive with a capacity of 291 MB. It has slow seek times and low throughput. Good software. Requires Mac Plus or later. \$3,299. CMS Enhancements, 2722 Michelson Dr., Irvine, CA 92715. (714) 222-6000. (Dec 90)

Corel 50 MB Removable \$\$\$ Because it uses the new Ricoh

magnetic-disk-cartridge technology, this drive offers a potentially more durable cartridge design than the older, established (and incompatible) SyQuest technology. Good for storing and transporting large files, Ricoh 50-MB cartridges may also offer better dust resistance. Doesn't match Sy-Quest drives' speed, however. Corel provides only basic documentation and little software. \$1,295. Corel Systems, 1600

Carling Ave., #190, Ottawa, Ontario K1Z 8R7, Canada. (613) 728-8200. (Feb '9

Cranel 330MB ttt%

The Cranel 330MB is a hard drive with an actual capacity of 321 MB. Average seek times and throughput. Large case. Good customer support. Requires Mac Plus or later. \$2,350. Cranel, Inc., 510F E. Wilson Bridge Rd., Worthington, OH 43085. (800) 288-3475 or (614) 433-0045. (Dec '90)

CubeFloppy \$\$\$%

The CubeFloppy is a compact 3.5inch floppy drive that can be used with NeXT computers. Can initialize, mount, and unmount UNIX floppies via NeXT's Shell. Some UNIX knowledge required. Good manual. Reads DOS 720K and 1.4-MB disks - doesn't read or write Mac-formatted disks. Software can translate files being transferred and also format DOS disks. Version 1.4 reviewed. Version 2.9 shipping. Requires NeXT computer. With software, \$595; software only, \$250. Digital Instrumentation Technology, Inc., 127 Eastgate Dr., Ste. 20500. Los Alamos, NM 87544. (505) 662-1482. (Oct '90)

Cutting Edge 40 MB \$\$\$%

The Cutting Edge 40 MB is a 40-MB external SCSI hard-disk drive based on the fast, reliable Ouantum P40S mechanism. Performance is average. Two extra AC plugs are provided and SCSI-ID selection is external, but the drive uses internal SCSI termination (a clear plastic window lets you view the setting but doesn't provide convenient access). The fan opening under the case is relatively exposed. \$799. Cutting Edge, 97 S. Red Willow Rd., Evanston, WY 82930. (307) 789-0582. (Apr '91)

Cutting Edge 44 MB Removable ttt

This SyQuest removable-cartridge drive is well built and has dualfuse protection and two switched AC outlets, but it is relatively expensive for a SyQuest drive. SyQuest technology offers speed and compatibility with an industry standard. It comes with a cartridge that has a capacity of about 44 MB. \$1,139. Cutting Edge, 97 S. Red Willow Rd., Evanston, WY 82930. (307) 789-0582. (Feb '91)

Data Enhancements ProCase PS1045-RM 111/2

This SyQuest removable-cartridge drive comes with powerful soft-ware, supports A/UX partitioning, and has good performance. The SCSI-ID number appears in the drive's desktop icon. It comes with a cartridge that has a capac-ity of about 44 MB. SyQuest technology offers speed and compatibility with an industry standard. \$598. Data Enhancements, Inc., 31328 Via Colinas, #102, Westlake Village, CA 91362. (818) 879-2700. (Feb '91)

Data Enhancements ProDisc PD1040 tttt/2

The ProDisc PD1040 (formerly called the Heart HD 1040) is a fast zero-footprint 40-MB hard-disk drive. Features include a two-year warranty, a thumb-wheel switch for SCSI-ID selection, and automatic head parking. Requires Mac Plus or later, \$479. Data Enhancements, Inc., 31328 Via Colinas, #102, Westlake Village, CA 91362.(818) 879-2700.(Feb '90)

Data Enhancements ProSystem PS1350 \$\$\$

The Data Enhancements Pro-System PS1350 is a 330-MB harddisk drive. Average seek times. Low throughput rate. Requires Mac Plus or later. \$3,189. Data Enhancements, Inc., 31328 Via Colinas, #102, Westlake Village, CA 91362. (818) 879-2700. (Dec

DaynaFile II \$\$\$\$\$ The DaynaFile II is a drive that lets Macs read 3.5- and 5.25-inch DOS floppy disks. The drive supports Mac high-density disks and all PC formats. Using a special INIT, the drive's volume icon appears on the desktop and is accessed like any other external drive. New DaynaFile II version replaces popular - but heavy original hardware design. Bundled DOS Mounter software lets Apple FDHD drives mount PC disks on the desktop. Requires Mac 512K or later with SCSI port. For a single drive configured for either 3.5-inch or 5.25-inch PC disks, \$899. Dayna Communications, Inc., 50 S. Main St., Salt Lake City, UT 84144, (801) 531-0600. (Oct '89) ★ '87 Eddy DaynaFile for NeXT \$\$\$

The DaynaFile is a floppy drive for the original NeXT computer. The 5.25-inch drive exchanges files between a NeXT and a Mac and between DOS machines and a NeXT. Comes with two applications, one that accesses DOS disks (but does not format them) and one that initializes and mounts UNIX-formatted floppies. Can't read or write Mac disks. Requires NeXT computer. 5.25-inch drive, \$750; 3.5-inch drive, \$850; both, Inc., 50 S. Main St., Salt Lake City, UT 84144. (801) 531-0600. (Oct 90) \$1,105. Dayna Communications,

Deltaic DS40Q \$\$\$

The Deltaic DS40Q is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. The drive is inexpensive, has a low profile, and has external SCSI-ID selection and SCSI termination. Unfortunately, little software is provided. and the SCSI IDs permitted include illegal numbers 7 through 9. Our test unit's fan rattled when the power-supply cord experienced distorting pressure. \$449. Deltaic Systems, 1701 Junction Ct., Ste. 302B, San Jose, CA

95112, (800) 745-1240 or (408) 441-1240. (Apr '91

Deltaic Server 1G ttt The Deltaic Server 1G is a 1gigabyte hard-disk drive with an actual capacity of 990 MB. Has an average seek time of 15 milliseconds. Based on the Micropolis 1598-15 mechanism. Provides good performance with the Deltaic 2.01 SCSI driver. SCSI-ID

selection is via external button, and SCSI termination uses an external plug. No bundled soft-ware. \$3,199. Deltaic Systems, 1701 Junction Ct., Ste. 302B, San Jose, CA 95112. (800) 745-1240 or (408) 441-1240. (July '91)

Deltaic Server 3000 111% Deltaic Server 300Q is a 326-MB hard-disk drive with short seek times. Average throughput performance. Requires Mac Plus or later. \$1,899. Deltaic Systems, 1701 Junction Ct., Ste. 302B, San Jose, CA 95112. (800) 745-1240 or (408) 441-1240, (Dec '90)

Deltaic Systems OptiServer 600 \$\$\$%

The Deltaic Systems OptiServer 600 is an erasable optical drive with software that maps out bad sectors and parks read/write heads. Extremely quiet. Few software utilities. Requires Mac Plus or later. \$3,499. Deltaic Systems, 1701 Junction Ct., Ste. 302B, San Jose, CA 95112. (800) 745-1240 or (408) 441-1240. (Nov '90)

Denon DRD-253 \$\$% This CD-ROM drive has ponderous performance and lags far behind most other drives. The builtin speaker provides good audio. Lacks audio software. Can be used as a stand-alone audio CD player. \$940. Denon America, 222 New Rd., Parsippany, NJ 07054. (201) 575-7810. (Mar '90)

DPI 44 Removable 1111

The vertically mounted DPI 44 Removable is a SyQuest removable-cartridge drive with a sturdy metal case. Its diode-regulated fan assures cool operation. Comes with a cartridge that has a capacity of about 44 MB. SyQuest technology offers speed and compatibility with an industry standard \$570. DPI, 40 Corning Ave., Milpitas, CA 95035. (800) 825-1850 or (408) 945-1850. (Feb

Ehman 45 MB Removable \$\$\$%

This SyQuest removable-cartridge drive is well built, is reasonably priced, and offers good performance. It comes with a cartridge that has a capacity of about 44 MB. SyQuest technology offers speed and compatibility with an industry standard. \$549. Ehman Engineering, Inc., 97 S. Red Willow Rd., Evanston, WY 82930. (800) 257-1666 or (307) 789-3830. (Feb '91)

Ehman 60 MB ttt The Ehman 60 MB hard drive runs cool and has a fine manual

and two-year warranty. It is slow and noisy but inexpensive. Automatic head parking. Push-button SCSI-ID selection. Zero footprint. Requires Mac Plus or later. \$429; internal, \$379. Ehman Engineering, Inc., 97 S. Red Willow Rd., Evanston, WY 82930. (800) 257-1666 or (307) 789-3830. (Feb '90)

Ehman HD 40 ttt

The Ehman HD 40 is a 40-MB external SCSI hard drive based on the fast, reliable Quantum P40S mechanism. Good performance. External SCSI ID selection but internal SCSI termination. The fan opening under the case is relatively exposed. This drive has an attractive price and sports two extra AC plugs to power other devices. \$429. Ehman Engineering, Inc., 97 S. Red Willow Rd., Evanston, WY 82930. (800) 257-1666 or (307) 789-3830. (Apr '91)

EMAC Metro 40 tttt/2 The well-designed EMAC Metro 40 is a 40-MB external SCSI harddisk drive based on the fast, reliable Quantum P40S mechanism. The drive can be positioned vertically or horizontally and has proprietary SCSI Sentry protec-tion for SCSI circuitry. SCSI-ID selection and SCSI termination are external, but the SCSI-ID selection switch allows "illegal" numbers 7 through 9. Good performance at an attractive price. \$799. EMAC (Everex Systems), 48431 Milmont Dr., Fremont, CA 94538. (800) 821-0806 or (415) 498-1111. (Apr '91)

EMAC Metro CD 1111

This CD-ROM drive is solidly built but has very slow disc access. It has good audio software and an internal speaker. Caddy is difficult to insert. SCSI-ID selection is via a push wheel. External SCSI termination, \$799, EMAC (Everex Systems), 48431 Milmont Dr., Fremont, CA 94538. (800) 821-0806 or (415) 498-1111. (June '91)

FastBack Tape \$\$\$\$%

The FastBack Tape package includes an FB120 tape drive (128-MB capacity), FastBack II 2.10, manuals for both, a SCSI-terminator block, a preformatted DC 2110 minicartridge, and all necessary cables. Costly and a little slow compared with other backup devices, but if tape is your backup medium of choice, you'd be hard pressed to find a more polished product. Requires Mac Plus or later, \$1,395. Fifth Generation Systems, 10049 N. Reiger Rd., Baton Rouge, LA 70809. (800) 873-4384 or (504) 291-7221. (July (00)

FWB Hammer 300 \$\$\$\$\%

The FWB Hammer 300 is a harddisk drive with an actual capacity of 323 MB. Undistinguished proprietary software. Short seek times and high throughput rate. Good for equipping a network server. Requires Mac Plus or later. \$2,999.

FWB, Inc., 2040 Polk St., Ste. 215, San Francisco, CA 94109. (415) 474-8055. (Dec '90)

FWB Hammer 1000 ttt

The FWB Hammer 1000 is a 1gigabyte hard-disk drive with an actual capacity of 988 MB. Has an average seek time of 15 milliseconds. Based on the Seagate ST41200NM mechanism. Provides good performance with the Hammer 1.4 SCSI driver. SCSI-ID selection is via external button, and SCSI termination uses an external plug. Includes outdated HDP 3.02 partitioning software but provides user-selectableinterleave, data-encryption, and password-protection capabilities. \$7,295. FWB, Inc., 2040 Polk St., Ste. 215, San Francisco, CA 94109. (415) 474-8055. (July '91)

FWB HammerDisk 600S

The Sony-based FWB Hammer-Disk 600S erasable optical drive is very fast. Software overrides copy protection. Has no auto-eject on dismount or shutdown. Requires Mac Plus or later. \$5,999. FWB, Inc., 2040 Polk St., Ste. 215, San Francisco, CA 94109. (415) 474-8055. (Nov '90)

FWB PocketHammer50 tttt/2 The well-designed FWB Pocket-Hammer50 is a 50-MB external SCSI hard drive based on the new, fast Quantum LP52S mechanism. This was the overall fastest drive in our April '91 lab report. Its compact construction doesn't skimp on desirable features, SCSI-ID selection and SCSI termination are external, the case is durable, power-on and drive-activity indicator lights are provided, and bundled software is excellent. Current formatting software allows accidental reformatting of startup drive. \$849. FWB, Inc., 2040 Polk St., Ste. 215, San Francisco, CA 94109. (415) 474-8055. (Apr '91) GCC UltraDrive 30 \$\$\$\$%

The GCC UltraDrive 30 comes with lots of useful software. Unusually informative manual. Zerofootprint unit. Push-button SCSI-ID selection. External termination. Noisy operation. Two-year warranty. Requires Mac Plus or later. \$599. GCC Technologies, Inc., 580 Winter St., Waltham, MA 02154. (800) 422-7777 or (617) 890-0880. (Feb '90)

GCC UltraDrive 40S tttt

The well-designed GCC Ultra-Drive 40S is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. Average performance. Good software is provided, including SUM II and 3.5 MB of shareware. This drive boasts solid construction, and both power-on and disk-activity status lights are clearly visible. SCSI-ID selection and SCSI termination are external. \$679. GCC Technologies, Inc., 580 Winter St., Waltham,

MA 02154. (800) 422-7777 or (617) 890-0880. (Apr '91)

GCC UltraDrive 430S tttt The GCC UltraDrive 430S is a hard-disk drive with an actual capacity of 428 MB. High throughput rate. Average seek times. Includes a QuickDraw print spooler, SUM II, 3.5 megabytes of publicdomain software, and its own envelope-printing utility. Good support. Requires Mac Plus or later. \$2,699. GCC Technologies, Inc., 580 Winter St., Waltham, MA 02154. (800) 422-7777 or (617) 890-0880. (Dec '90)

Hard Drives International CD-ROM \$\$\$%

An inexpensive CD-ROM drive with good data performance. No preamp audio output and limited volume control. The SCSI-ID selection that's done via DIP switches or jumpers is clumsy. External SCSI termination. \$649. Hard Drives International, 1912 W. Fourth St., Tempe, AZ 85281. (800) 767-3475 or (602) 967-4999. (June '91)

Hard Drives International POWERDrive 320 111/2

The HDI POWERDrive 320 is an inexpensive hard-disk drive with an actual capacity of 330 MB. Average seek times and throughput. Requires Mac Plus or later. \$1,449. Hard Drives International, 1912 W. Fourth St., Tempe, AZ 85281. (800) 767-3475 or (602) 967-4999. (Dec '90)

Hard Drives International POWERDrive 44 Removable

This SyQuest removable-cartridge drive has a sturdy metal case and comes with good software, tollfree tech support, and a cartridge. The version we tested lacked shielding on SCSI connectors. It comes with a cartridge that has a capacity of about 44 MB. SyQuest technology provides speed and compatibility with an industry standard. \$499; each additional cartridge, \$79. Hard Drives International, 1912 W. Fourth St., Tempe, AZ 85281. (800) 767-3475 or (602) 967-4999. (Feb '91) Hard Drives International

POWERDrive 1050EMC \$\$\$\% The POWER Drive 1050 EMC is a 1-gigabyte hard-disk drive with an actual capacity of 990 MB. Has an average seek time of 15 milliseconds. Based on the Micropolis 1598-15 mechanism. Provides good performance with the Disk Manager Mac 2.23 SCSI driver. Software provides user-selectable-interleave, partitioning, and password-protection functions. SCSI-ID selection is via external button or software. Internal SCSI termination. \$2,699. Hard Drives International, 1912 W. Fourth St., Tempe, AZ 85281. (800) 767-3475 or (602) 967-4999. (July '91) iDS Pro 20 \$\$\$%

The Pro 20 is a compact 20-MB hard-disk drive. Operation is very

quiet, because there's no fan, so it also runs warm. Nice features and lots of software included. Twoyear warranty. Requires Mac Plus or later. \$695. iDS Systems, Inc., 2107 N. First St., Ste. 280 (Koll Bayshore Bldg.), San Jose, CA 95131. (800) 733-0078 or (408)

752-2952. (Feb '90) IDS VPS340 \$\frac{1}{2}\frac{1}{2}\frac{1}{2}\text{The iDS VPS340 is a compact} hard-disk drive with an actual capacity of 330 MB. Average seek times and throughput. Small case. Requires Mac Plus or later. \$2,995. iDS Systems, Inc., 2107 N. First St., Ste. 280 (Koll Bayshore Bldg.), San Jose, CA 95131. (800) 733-0078 or (408) 752-2952. (Dec

iDS Wip 40MB \$\$\$\$

The iDS Wip 40MB is a 40-MB external SCSI hard-disk drive based on the slow, reliable Conner CP3040 mechanism. The drive is compact and lightweight and has external SCSI-ID selection. Unfortunately, SCSI termination is internal; only one SCSI port is provided; and the drive takes power from the Mac's floppydrive port, which isn't advisable for the Mac Classic. \$529. iDS Systems, Inc., 2107 N. First St., Ste. 280 (Koll Bayshore Bldg.), San Jose, CA 95131. (800) 733-0078 or (408) 752-2952. (Apr '91) lomega Transportable 44

For maximum reliability in a removable-cartridge drive — albeit with a high price, heavy weight and slow performance — the Ber-noulli Transportable 44 is an excellent choice. Best used for data transport, storage, and backup but not for constant spinning for hours or days at a time. Its software can format a cartridge in the background, a handy time saver. Bernoulli technology is established, but if you share data with many other users, a Sy Quest drive might be preferable. \$1,399. Iomega Corp., 1821 W. 4000 S., Roy, UT 84067. (800) 456-5522 or (801)

778-1000. (Feb '91 Jasmine DirectDrive 40 \$\$\$% The low-priced DirectDrive 40 is a 40-MB external SCSI hard-disk drive based on the slow, reliable Fujitsu M2611S mechanism. Has excellent documentation. The low-profile drive has two extra AC plugs and a power supply that auto-switches between North American and European voltages. SCSI-ID selection is external, but SCSI termination is internal; SCSI-ID selection switch allows "illegal" numbers 7 through 9. Good software is provided, including SUM II and 10 MB of shareware, \$369. Jasmine Techvale, CA 94089. (800) 347-3228 or (408) 752-2900. (Apr '91) Kennect Drive 2.4 \$555/2

The Drive 2.4 is a connector/drive combination when used with the

Rapport connector attached to the external-disk-drive port of a Mac Plus or SE. DOS 3.5-inch disks can be inserted into the Mac's internal drive and read through AFE. Supports Mac- and PC-formatted disks. A control panel is used to control all drive default formats. Not compatible with Mac IIfx or Portable. Requires Mac Plus or later. Drive 2.4, \$495; Rapport, \$295. Kennect Technology, 120A Albright Way, Los Gatos, CA 95030. (800) 552-1232 or (408) 370-2866. (Feb '90) La Cie 1000 MB ZFP Plus \$\$\$/

The La Cie 1000 MB ZFP Plus is a 1-gigabyte hard-disk drive with an actual capacity of 988 MB. Has an average seek time of 15 milliseconds. Based on the Seagate ST41200NM mechanism. Provides good performance with the Silverling 5.27 SCSI driver. Software provides password-protection and data-encryption functions. SCSI-ID selection is via external button. Internal SCSI termination. Bundled with Norton Utilities for the Macintosh (except optimizer). \$4,549. La Cie Ltd., 19552 S.W. 90th Ct., Tualatin, OR 97062. (800) 999-0143 or (503) 691-0771. (July '91) La Cie 45 MB Removable

This SyQuest removable-cartridge drive is solidly built and has an auto-switching power supply. The drive is bundled with Norton Utilities for the Mac and Silverlining formatting software. The La Cie drive comes with a cartridge that has a capacity of about 44 MB. SyQuest technology offers speed and compatibility with an industry standard, \$799. La Cie Ltd., 19552 S.W. 90th Ct., Tualatin, OR 97062. (800) 999-0143 or (503) 691-0771. (Feb '91)

La Cie 600R Magneto-Optical

The La Cie 600R Magneto-Optical erasable optical drive is fast. SilverLining formatting software provides good SCSI performance. Requires Mac Plus or later. \$4,149. La Cie Ltd., 19552 S.W. 90th Ct., Tualatin, OR 97062. (800) 999-0143 or (503) 691-0771. (Nov

La Cie Cirrus 84 \$\$\$\$\%

The Cirrus 84 is a sleek, quiet 84-MB hard-disk drive. Five-year warranty. Silverlining formatting and utility software is bundled. Has two chassis — one for drive. one for modular power supply. Fast SCSI evaluator. Software SCSI ID. Internal terminator. No indicators. Requires Mac Plus or later. \$849. La Cie Ltd., 19552 S.W. 90th Ct., Tualatin, OR 97062. (800) 999-0143 or (503) 691-0771. (Feb '90)

La Cie Tsunami 50 \$\$\$\$% The well-designed La Cie Tsunami 50 is an external, 50-MB SCSI hard-disk drive based on the new, fast Quantum LP52S

mechanism. This was the secondfastest drive overall in our April '91 lab report. Compact construction allows vertical or horizontal orientation. Unfortunately, SCSI termination is internal and SCSI-ID selection is via unlabeled DIP switches. The case is durable, power-on as well as drive-activity indicator lights are provided, and bundled software is excellent. Be careful when buying cables for this drive — it has 25-pin SCSI connectors. \$649. La Cie Ltd., 19552 S.W. 90th Ct., Tualatin, OR 97062. (800) 999-0143 or

(503) 691-0771. (Apr '91) **La Cie ZFP 400 1111** The La Cie ZFP 400 is an affordable hard-disk drive with an actual capacity of 423 MB. Average seek times and high throughput rate. Bundled with 5 MB of publicdomain software, Silverlining formatting software, and Norton Utilities for the Macintosh. Internal SCSI termination. Good support. Requires Mac Plus or later. \$1,999. La Cie Ltd., 19552 S.W. 90th Ct., Tualatin, OR 97062. (800) 999-0143 or (503) 691-0771. (Dec '90)

Liberty 40 tttt

The well-designed Liberty 40 MB is a 40-MB external SCSI harddisk drive based on the fast, reliable Quantum P40S mechanism. The price is moderate, considering that this compact drive qualifies as a true totable. Performance is average. Internal SCSI termination is difficult to disable, but SCSI-ID selection is via external push wheel. Good formatter but no other software. \$699. Liberty Systems, 122 Saratoga Ave., #16, Santa Clara, CA 95051. (408) 983-127. (Apr '91)

MacAvenue Protegé 40 tttt/2 The well-designed MacAvenue Protegé 40 is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. With a low price, solid construction, and good ventilation, this drive has a chunky shoebox shape that lacks a zero foot print to fit under a Mac Classic, and it can't be vertically oriented. Average performance. External SCSI-ID selection and SCSI termination. \$455. Mac-Avenue, 12303 Technology Blvd., Austin, TX 78727. (800) 888-6221 or (512) 331-0446. (Apr '91)

MacLand 40MB \$\$\$
The MacLand 40MB is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. The drive is inexpensive and offers good performance. SCSI ID selection is external and SCSI termination is internal. SCSI-ID selection switch allows "illegal" SCSI numbers 7 through 9. Autoswitching power supply for use with North American or European voltages. \$399. MacLand, Inc., 4685 S. Ash Ave., Ste. H-5,

Tempe, AZ 85282, (800) 333-3353 or (602) 820-5802. (Apr '91)

MacLand Imprimis 1.2 Gigabyte \$\$\$\$

The MacLand Imprimis 1.2 Gigabyte is a hard-disk drive with an actual capacity of 988 MB. Has an average seek time of 15 milli-seconds. Based on the Seagate ST41200NM mechanism, Provides good performance with the Formatter Two 3.27 SCSI driver. SCSI-ID selection is via external button. Internal SCSI termination. Formatter compatibility and hard partitioning good for use with A/UX. Two-year warranty, \$2,899. MacLand, Inc., 4685 S. Ash Ave., Ste. H-5, Tempe, AZ 85282. (800) 333-3353 or (602) 820-5802. (July '91)

MacLand Quantum 80 \$\$\$\$ The Quantum 80 is a good 80-MB drive. Fastand quiet and runs cool. Read/write heads park automatically. SCSI-ID selection is set by a push-button switch. Has internal SCSI termination. Manual is skimpy. Requires Mac Plus or later. Internal, \$459; external, \$539. MacLand, Inc., 4685 S. Ash Ave., Ste. H-5, Tempe, AZ 85282. (800) 333-3353 or (602) 820-

5802. (Feb '90) MacLand SyQuest 42 MB \$\$\$ One of the least-expensive removable-cartridge drives, the MacLand SyQuest 42 MB has average performance and is bundled with archiving and restoration utilities. It comes with a cartridge that has a capacity of about 44 MB. SyQuest technology offers speed and compatibility with an industry standard. With cartridge, \$507. MacLand, Inc., 4685 S. Ash Ave., Ste. H-5, Tempe, AZ 85282. (800) 333-3353 or (602) 820-5802. (Feb '91)

MacProducts Magic 1.2 Gigabyte HD \$\$\$\$

The MacProducts Magic 1.2 Gigabyte HD is a hard-disk drive with an actual capacity of 988 MB. Has an average seek time of 15 milliseconds. Based on the Seagate ST41200NM mechanism. Provides good performance with the Disk Manager Mac 2.23 SCSI driver. Software provides backup and password-protection features. SCSI-ID selection is via external button or software, and SCSI termination uses an external plug. Includes 10 MB of shareware. \$2,795. MacProducts USA, Inc., 8303 Mopac Expy., Ste. 218, Austin, TX78759. (800) 622-3475 or (512) 343-9441. (July '91) MacProducts Magic 40MB \$%

The Magic 40MB is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. The test unit had unshielded plastic SCSI connectors and relied on software to select SCSI ID. The absence of an external SCSI-ID selection switch isn't a problem in a single setup but is potentially hazardous

to data if you swap among multiple hard drives. Good software and 11 MB of bundled shareware. SCSI termination is external. Requires Mac Plus or later. \$389. MacProducts USA, Inc., 8303 Mopac Expy., Ste. 218, Austin, TX 78759. (800) 622-3475 or (512) 343-9441. (Apr '91) MacProducts MagicDrive 105

The MagicDrive 105 is reasonably priced and fast. This zerofootprint unit comes with approximately 10 MB of publicdomain and shareware software. SCSI ID is software-controlled. Runs warm. Requires Mac Plus or later. \$419. MacProducts USA, Inc., 8303 Mopac Expy., Ste. 218, Austin, TX 78759. (800) 622-3475 or (512) 343-9441. (Feb '90)

MacProducts Magic 45 Removable tttt

An overall good buy, the Magic 45 is a SyQuest 44-MB removable-cartridge drive that has excellent speed at a good price. Documentation is outdated. SyQuest technology offers speed and compatibility with an industry standard. It comes with a cartridge that has a capacity of about 44 MB. \$499; cartridge, \$69. MacProducts USA, Inc., 8303 Mopac Expy., Ste. 218, Austin, TX 78759. (800) 622-3475 or (512) 343-9441. (Feb '91)

MacTel 45 Removable 1111 Although not the fastest SyQuest removable-cartridge drive, this solidly built product has complete hardware features. Excellent software includes BackMatic and AutoSave II for backup. Drive supports A/UX partitions and comes with one cartridge that has a capacity of about 44 MB. SyQuest technology offers speed and compatibility with an indus-try standard. \$697. MacTel Technology, 3007 N. Lamar Blvd., Austin, TX 78705. (800) 950-8411 or (512) 451-2600. (Feb '91)

MacTel HD Index Gigabyte

The MacTel HD Index Gigabyte is a 1-gigabyte hard drive with an actual capacity of 988 MB. Average seek time is 15 milliseconds. Based on the Seagate ST41200NM mechanism. Gives good performance with the HD Chauffeur 1.3 SCSI driver. Software has partitioning, passwordprotection, backup, and data-encryption capabilities. SCSI-ID selection is via external button, and SCSI termination uses an external plug. Includes 20 MB of shareware. \$2,899. MacTel Technology, 3007 N. Lamar Blvd., Austin, TX 78705. (800) 950-8411 or (512) 451-2600. (July '91) MacTel Index 40MB \$\$\$%

The MacTel Index 40MB is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. The price is attractive, construction is solid,

and the drive has a low profile. Performance is average. The two AC outlets are handy but aren't equipped with switches. SCSI-ID selection is external, and SCSI termination is internal. Good software and 14 MB of shareware provided. \$439. MacTel Technology, 3007 N. Lamar Blvd., Austin, TX 78705. (800) 950-8411 or (512) 451-2600. (Apr '91)

MacTown DataStor DS40 tt The DataStor DS40 is a 40-MB external SCSI hard-disk drive based on the slow, reliable Conner CP3040 mechanism. This drive has internal SCSI termination, and the external SCSI-ID switch allows "illegal" ID numbers 7 through 9. Low price is this product's redeeming virtue. \$339. MacTown, 4657 MacArthur Ln., Boulder, CO 80303. (800) 338-4273. (Apr '91) MacTown DataStor

DS44/25MR \$\$1/2

This SyQuest removable-cartridge drive has rudimentary documentation and software but has a quiet fan. Comes with a cartridge that has a 44-MB capacity. SyQuest technology offers speed and compatibility with an industry standard. With cartridge, \$569. MacTown, 4657 MacArthur Ln., Boulder, CO 80303. (800) 338-4273. (Feb '91)

MacTown DataStor HM1.2/15M \$\$\$\$1/2

The MacTown DataStor HM1.2/ 15M is a fast 1-gigabyte hard-disk drive with an actual capacity of 990 MB. Has an average seek time of 15 milliseconds. Based on the Seagate ST41200NM mechanism. Provides very good perfor-mance with the StorageWare 1.3b13 SCSI driver. Software provides backup and partitioning capabilities. SCSI-ID selection is via external button, but SCSI termination is internal. \$2,699. MacTown, 4657 MacArthur Ln., Boulder, CO 80303. (800) 338-4273. (July '91)

Mass Microsystems DataPak 45 **tttt**

This well-built SyQuest removable-cartridge drive comes with excellent documentation and is bundled with Disk Doubler software. Has two switched AC outlets and internal SCSI termination. Expensive for a SyQuest drive. \$1,199. Mass Microsystems, Inc., 810 W. Maude Ave., Sunnyvale, CA 94086. (800) 522-7979 or (408) 522-1200. (Feb '91)

MicroNet CPK-40p \$\$\$\$ The well-designed MicroNet CPK-40p is a 40-MB external SCSI hard-disk drive based on the slow, reliable Conner CP3040 mechanism. Compact and well ventilated, this drive has no fan, so it's quiet but potentially vulnerable in hot environments. Good formatting software is provided, and both SCSI-ID selection and SCSI termination are external.

\$825. MicroNet Technology, Inc., 20 Mason, Irvine, CA 92718. (714) 837-6033. (Apr '91) MicroNet Micro Ili-620 \$\$\$\$/2

The Micro IIi-620 is a fast, 600-MB internal hard-disk drive for the Mac II. The drive is a repackaged Imprimis Wren V (Control Data). Average access time is 16 milliseconds, Good manual, Requires Mac IIx or IIfx with lowprofile SIMMs. \$3,695. MicroNet Technology, Inc., 20 Mason, Irvine, CA 92718. (714) 837-6033. (Aug '89)

MicroNet Micro/Optical

SB-SMO-1 1111 The MicroNet Micro/Optical SB-SMO-1 is a fast erasable optical drive. Can turn off data verification while writing to the disc. Has ability to combine many discs into a single volume. Requires Mac Plus or later, \$4,995, Micro-Net Technology, Inc., 20 Mason, Irvine, CA 92718. (714) 837-6033. (Nov '90)

MicroNet MR45 \$\$\$\$

The MR45 is a good choice among SyQuest removable-cartridge drives. It comes with excellent documentation, powerful soft-ware, and a well-shielded power supply. Both SCSI-ID selection and SCSI termination are external. With cartridge \$995; with Retrospect Remote, \$1,195. MicroNet Technology, Inc., 20 Mason, Irvine, CA 92718. (714) 837-6033. (Feb '91)

MicroNet MS-404 tttt

The MicroNet MS-404 is a harddisk drive with an actual capacity of 423 MB. Custom-designed case is excellently crafted. Average seek times and high throughput rate. No bundled software except for a proprietary installation utility. Requires Mac Plus or later. \$3,795. MicroNet Technology, Inc., 20 Mason, Irvine, CA 92718. (714) 837-6033. (Dec '90)

MicroNet MS30 tttt The MS30 is a well-constructed zero-footprint 30-MB hard-disk drive. The SCSI ID is set via a DIP switch. Excellent setup software. Requires Mac Plus or later. \$759. MicroNet Technology, Inc., 20 Mason, Irvine, CA 92718. (714)

837-6033. (Feb '90)

MicroNet MS62 **\$55** The MicroNet MS62 is a wellconstructed zero-footprint 60-MB hard-disk drive. Outstanding software. Slow. Strong case. Excellent service and support. Requires Mac Plus or later. \$1,095. MicroNet Technology, Inc., 20 Mason, Irvine, CA 92718. (714)

837-6033. (May '90) MicroNet SB-1000NP \$\$\$\$\% The MicroNet SB-1000NP is a fast 1-gigabyte hard-disk drive with an actual capacity of 987 MB. Has an average seek time of 15 milliseconds. Based on the Seagate ST41200NM mechanism. Provides good performance with the MicroNet Utility 5.0.3 SCSI

driver. Software allows passwordprotection, backup, and A/UXcompatible-partitioning functions. SCSI-ID selection is via external button, and SCSI termination uses an external plug. Quiet, temperature-controlled fan. Included NuPort card optimizes SCSI throughput via NuBus. Requires Mac II series. \$5,995. MicroNet Technology, Inc., 20 Mason, Irvine, CA 92718. (714) 837-6033. (July '91)

MicroNet SBT-1288NP \$\$\$\$1/2 The MicroNet SBT-1288NP is a very fast 1-gigabyte hard-disk drive with an actual capacity of 1.266 MB. Has an average seek time of 13 milliseconds. Based on a pair of Seagate Wren-Runner 2 mechanisms. Provides very good performance with the MicroNet Utility 5.0.3 SCSI driver. Software allows password-protection, backup, and A/UX-compatiblepartitioning functions. SCSI-ID selection is via external button, and SCSI termination uses an external plug. Quiet, temperaturecontrolled fan. Included NuPort card optimizes SCSI throughput via NuBus. Requires Mac II series. \$9,990. MicroNet Technology, Inc., 20 Mason, Irvine, CA 92718. (714) 837-6033. (July '91) Microtech CD600 \$\$\$\$

This CD-ROM drive is well built and offers good performance. It has no preamp output, and volume control is limited. SCSI-ID selection is done via push wheel. External SCSI termination. \$899. Microtech International, Inc., 158 Commerce St., East Haven, CT 06512. (800) 626-4276 or (203) 468-6223. (June '91)

Microtech Europa 40 1111 The elegant Microtech Europa 40 is a 40-MB external SCSI harddisk drive based on the fast, reliable Quantum P40S mechanism. Average performance. SCSI-ID selection is external, but SCSI termination is internal. Good value for moderate price. Trade-in plan gives credit for drives swapped for new Microtech drives. Fiveyear warranty. \$569 list. Microtech International, Inc., 158 Commerce St., East Haven, CT 06512. (800) 626-4276 or (203) 468-6223. (Apr '91)

Microtech MicroKCN N1000

The Microtech MicroKCN N1000 is a 1-gigabyte hard-disk drive with an actual capacity of 988 MB. Has an average seek time of 15 milliseconds. Based on the Seagate ST41200NM mechanism. Provides good performance with the Microtech HDF 3.27 SCSI driver. Software provides filerecovery, optimizing, backup, and partitioning capabilities. SCSI-ID selection is via external button, but SCSI termination is internal. Five-year warranty. \$4,599. Microtech International, Inc., 158 Commerce St., East Haven, CT

06512. (800) 626-4276 or (203) 468-6223. (July '91'

Microtech N320 1111

The Microtech N320 is a compact hard-disk drive with an actual capacity of 330 MB. Average seek times and throughput rate. Good software and support. Requires Mac Plus or later. \$2,299. Microtech International, Inc., 158 Commerce St., East Haven, CT 06512. (800) 626-4276 or (203) 468-6223. (Dec '90)

Microtech Nova 40 tttt

The Nova 40 is an excellent zerofootprint, 40-MB hard-disk drive. It has a sturdy case, a five-year warranty, and automatic head parking. Internal termination. Requires Mac Plus or later. \$649. Microtech International, Inc., 158 Commerce St., East Haven, CT 06512. (800) 626-4276 or (203) 468-6223. (Feb '90) Microtech OR650 \$\$\$

The Microtech OR650 is an erasable optical drive with slow performance. Good software, Total Recall, allows unattended backups. Includes Norton Utilities for the Macintosh. Requires Mac Plus or later. \$4,795. Microtech International, Inc., 158 Commerce St., East Haven, CT 06512. (800) 626-4276 or (203) 468-6223. (Nov

Microtech R50 \$\$\$\$

Because it uses Ricoh's new magnetic-disk-cartridge technology, this drive offers a potentially more durable cartridge design than the older, established (and incompatible) SyQuest technology. Good for storing and transporting large files, Ricoh 50-MB cartridges may also offer better dust resistance. Doesn't match Sy-Quest drives' speed, however. If you want to be an early adopter of this promising new standard, the R50 is a good choice among Ricoh mechanisms. It comes with a cartridge and excellent utilities and formatting software. \$1,299. Microtech International, Inc., 158 Commerce St., East Haven, CT 06512. (800) 626-4276 or (203) 468-6223. (Feb '91)

Mirror CD-ROM tttt This solidly built CD-ROM drive offers good performance. Has good audio software, but volume control is limited. SCSI-ID selection is via push wheel. External SCSI termination. No bundled CD-ROMs. AC outlet provided. \$697. Mirror Technologies, Inc., 2644 Patton Rd., Roseville, MN 55113. (800) 654-5294 or (612)

633-4450. (June '91)
Mirror M 40 \$\$\$\$
The well-built Mirror M 40 is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. Has average performance. Solid construction and a low profile. SCSI-ID selection and SCSI termination are external, and two switched AC outlets are provided. Unfortunately, SCSI-ID switch allows "illegal" numbers 7 through 9. Bundled software includes 11 MB of shareware. \$457. Mirror Technologies, Inc., 2644 Patton Rd., Roseville, MN 55113. (800) 654-5294 or (612) 633-4450. (Apr '91)

Mirror MP290 \$\$\$\% The Mirror MP290 is a 291-MB hard-disk drive. Long seek times and low throughput rate. Large case. Requires Mac Plus or later. \$1,497. Mirror Technologies, Inc., 2644 Patton Rd., Roseville, MN 55113. (800) 654-5294 or (612) 633-4450, (Dec '90)

Mirror RM42 ttt

The RM42 is a well-built SyQuest removable-cartridge drive. It comes with QuicKeys, DiskTop, MockPackage+, and 10 MB of public-domain software. SCSI-ID selection and termination are external. \$497. Mirror Technologies, Inc., 2644 Patton Rd., Roseville, MN 55113. (800) 654-5294 or (612) 633-4450. (Feb '91)

Mirror RM600 Optical \$\$\$ The Mirror RM600 Optical is an

erasable optical drive with slow performance. Software allows manual sector mapping. Autoeject option at dismount or shutdown. Requires Mac Plus or later. \$2,997. Mirror Technologies, Inc., 2644 Patton Rd., Roseville, MN 55113. (800) 654-5294 or (612)

633-4450. (Nov '90) NEC Intersect CDR-72 111 This CD-ROM drive is well-built and has fast Photoshop performance, but it has slow disc access. SCSI-ID selection is done via DIP switch, External SCSI termination. No bundled CD-ROM discs. \$799. NEC Technologies, Inc., 1414 Massachusetts Ave., Box-borough, MA 01719. (800) 632-4636 or (508) 264-8000. (June

Neoteric Systems Genesis 6000i tttt

The Neoteric Systems Genesis 6000i (formerly available from MACsetra Technologies) is an erasable optical drive that has good speed and software. It erases quickly and has a filtered fan. Can combine many discs into a single volume. Requires Mac Plus or later. \$5,495. Neoteric Systems, Inc., 350 2nd Ave. South, Saskatoon, Saskatchewan S7K 1L1, Canada. (800) 667-5488 or (306) 665-6000. (Nov '90)

Ocean Microsystems

Tidalwave 650 tttt The Tidalwave 650 is a fast erasable optical drive. Includes MacTools Deluxe plus software to find and mount Ocean drives on a SCSI chain. Requires Mac Plus or later. \$4,195. Ocean Microsystems, 246 E. Hacienda Ave., Campbell, CA 95008. (800) 262-3261 or (408) 374-8300. (Nov

Ocean Totem IV 44MB ttt/2 This magnetic-disk-cartridge drive uses the popular Bernoulli flexible-media technology and has a clever case design that allows vertical or horizontal orientation. Slow and relatively expensive. Bundled with MacTools Deluxe. A Bernoulli-based drive is an excellent choice if reliability is top priority, but don't let the drive spin for hours or days at a time. With cartridge, \$1,350; Totem IIID dual, \$2,350. Ocean Microsystems, 246 E. Hacienda Ave., Campbell, CA 95008. (800) 262-3261 or (408) 374-8300. (Feb '91)

OMI CDP-1B CD-ROM ttt This CD-ROM drive is well built and offers fast Photoshop performance. Includes HyperCard audio software. SCSI-ID selection via push wheel. External SCSI termination. \$795. Optical Media International (OMI), 180 Knowles Dr., Los Gatos, CA 95030. (800) 347-2664 or (408) 376-3511. (June '91)

Optical Access International

CM 231 \$\$\$\% This CD-ROM drive is well built and has good audio features but also a high list price. Its non-standard disc caddy is difficult to load. SCSI-ID selection is done via DIP switch. External SCSI termination. Two-year warranty. \$1,049. Optical Access International, 800 W. Cummings Pk., Ste. 2050, Woburn, MA 01801. (800) 433-5133 or (617) 937-3910. (June '91)

Optima Concorde 1050 tttt

The Optima Concorde 1050 is a 1-gigabyte hard-disk drive with an actual capacity of 988 MB. Average seek time of 15 milliseconds. Based on the Seagate ST41200NM mechanism. Provides good performance with the DiskInit 2.1 SCSI driver. Software has partitioning, passwordprotection, and file-recovery capabilities. SCSI-ID selection is via external button, and SCSI termination uses an external plug. \$5,995. Optima Technology, 17526 Von Karman, Irvine, CA 92714. (714) 476-0515. (July '91)

Optima DisKovery 40 1111 The distinctively designed DisKovery 40 is a 40-MB external SCSI hard-disk drive based on the slow, reliable Conner CP3040 mechanism. The price is attractive enough to forgive the sluggish performance, and the drive can be set up in either vertical or horizontal orientation. SCSI-ID selection and SCSI termination are external. SCSI-ID switch allows "illegal" numbers 7 through 9. Indicator lights are provided for disk-access activity, power-on, and termination status. \$695. Optima Technology, 17526 Von Karman, Irvine, CA 92714. (714) 476-0515. (Apr '91) Optima MiniPak 310 \$\$\frac{1}{2}\$\$\frac{1}{2}\$\$\$\$\$

The Optima MiniPak 310 is a compact 311-MB hard-disk drive. Expensive. Long seek times. Good software. Small case. Requires Mac Plus or later. \$4,395. Optima Technology, 17526 Von Karman, Irvine, CA 92714. (714) 476-0515. (Dec '90) PCPC MacBottom 50MB

\$\$\$\$% The well-designed, inexpensive MacBottom 50MB is a 50-MB external SCSI hard-disk drive based on the new, fast Quantum LP52S mechanism. The lowprofile case fits well under a Mac Classic. SCSI-ID selection is ex-ternal, but SCSI termination is internal. Power-on and driveactivity indicator lights are provided. Unfortunately, this single-port drive has a 25-pin nondetachable cable and the SCSI-ID switch allows "illegal" numbers 7 through 9, \$399, PCPC (Personal Computer Peripherals Corp.), 4710 Eisenhower Blvd., Bldg. A4, Tampa, FL 33634. (800) 622-2888 or (813) 884-3092. (Apr '91)

Pinnacle REO-650 \$\$\$ 1/2 The Pinnacle REO-650 is an erasable optical drive with average speed. A/UX option. Voltage selector. Few utilities. Requires Mac Plus or later. \$4,695. Pinnacle Micro, 15265 Alton Pkwy., Irvine, CA 92718. (800) 553-7070 or (714) 727-3300. (Nov '90)

PLI Infinity 40 Turbo ttt The Infinity 40 Turbo is a good choice among SyQuest removable-cartridge drives, despite its high list price. It comes with excellent utilities software and formatting plus some great programs for backup, file compression, optimizing, and diagnostics. SCSI termination, however, is via DIP switches. \$899 with formatting software only; \$999 with bundled utilities and shareware. PLI (Peripheral Land, Inc.), 47421 Bayside Pkwy., Fremont, CA 94538. (800) 288-8754 or (415) 657-2211. (Feb '91)

PLI Infinity Optical \$555
The PLI Infinity Optical is a fast erasable optical drive. A/UX option allows 1,024-byte-sector discs. Includes TurboSpool print spooler and a vertical stand. Requires Mac Plus or later. \$4,699. PLI (Peripheral Land, Inc.), 47421 Bayside Pkwy., Fremont, CA

94538. (800) 288-8754 or (415) 657-2211. (Nov '90)
PLI PL 1.2 Gigabyte \$\frac{1}{2}\frac{1}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1} capacity of 990 MB. Has an average seek time of 15 milliseconds. Based on the Seagate ST41200NM mechanism. Provides good performance with the PLI Formatter 3.0 SCSI driver. SCSI-ID selection is via external dial, and SCSI termination uses external DIP switches. Includes PLI Turbo Utilities for partitioning, optimizing, and backup func-tions. \$4,999. PLI (Peripheral Land, Inc.), 47421 Bayside Pkwy., Fremont, CA 94538. (800) 288-8754or(415)657-2211.(July '91)

MiniFinders

PLI PL 40 Turbo \$\$\$\$

The PLI PL 40 Turbo is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. Drive uses unlabeled DIP switches for external SCSI termination. Low profile and good construction, with external SCSI-ID selection. Good formatting software and 9 MB of bundled shareware. \$599. PLI (Peripheral Land, Inc.), 47421 Bayside Pkwy., Fremont, CA 94538. (800) 288-8754 or (415) 657-2211. (Apr '91) PLI PL CD-ROM \$\$\$\$\%

This solidly built, expensive CD-ROM drive provides good per-formance. SCSI-ID selection is done via rotary switch. Has an external SCSI-termination switch. In dirty environments, fan may introduce dust onto the read/write lens. \$999. PLI (Peripheral Land, Inc.), 47421 Bayside Pkwy., Fremont, CA 94538. (800) 288-8754 or (415) 657-2211. (June

PLI PL320F Turbo ttt

The PLI PL320F Turbo is a fast 320-MB hard-disk drive. Short seek times and average throughput rate. Large case. Good support. Requires Mac Plus or later. \$2,799. PLI (Peripheral Land. Inc.), 47421 Bayside Pkwy., Fremont, CA 94538. (800) 288-8754 or (415) 657-2211. (Dec '90)

PM1.44 Floppy Drive \$\$\$

The PM1.44 Floppy Drive is used with NeXT computers. Can read Mac 1.4-MB disks. Can read and write DOS- and UNIX-formatted disks, but UNIX disks must be initialized by the PM1.44 drive. Fits under or on top of the NeXT CPU cube. Common-Link software, which also writes to Mac disks, is bundled. Requires NeXT computer. \$395. Pacific Microelectronics, 201 San Antonio Cir., Ste, C250, Mountain View, CA 94040. (800) 628-3475 or (415) 948-6200. (Oct '90) Procom MCD 650 \$\$\$\%

This solidly built CD-ROM drive has good performance, but volume control is limited and there's no preamp output. SCSI-ID selection is via rotary switch. External SCSI termination, \$895, Procom Technology, 200 McCormick Ave., Costa Mesa, CA 92626. (714) 549-9449. (June '91)

Procom MD 320 \$\$\$\$

The Procom MD 320 is a 323-MB hard-disk drive. Short seek times and high throughput rate. Requires Mac Plus or later, \$3,295, Procom Technology, 200 McCormick Ave., Costa Mesa, CA 92626. (714) 549-9449. (Dec '90)

Procom MEOD650 ttt

The Procom MEOD650 is a slow erasable optical drive. Desktop icon has SCSI ID. Has 25-pin SCSI connectors. Includes Retrospect backup software. Requires Mac Plus or later. \$4,495. Procom Technology, 200 McCormick

Ave., Costa Mesa, CA 92626. (714) 549-9449. (Nov '90)

Relax Hard 300 Plus **ttt**

The Relax Hard 300 Plus is a 291-MB hard-disk drive. Average seek times and throughput. Switched power center, Requires Mac Plus or later. \$1,279. Relax Technology, Inc., 3101 Whipple Rd., Ste. 22, Union City, CA 94587. (415) 471-6112. (Dec '90)

Relax Hard Plus 1.0 Gigabyte

The Relax Hard Plus 1.0 Gigabyte is an inexpensive hard-disk drive with an actual capacity of 1,000 MB. Has an average seek time of 15 milliseconds. Based on the Seagate ST41200NM mechanism. Provides good performance with the Relax 1.10 SCSI driver. Software provides password-protection, encryption, and backup functions. SCSI-ID selection is via external button, and SCSI termination uses an external plug. Diversified I/O 2.01 SCSI driver necessary for partitioning. \$2,999; Diversified I/O 2.01 SCSI driver. \$59. Relax Technology, Inc., 3101 Whipple Rd., Ste. 22, Union City, CA 94587. (415) 471-6112. (July

Relax Mobile 42 \$\$\$%

The Mobile 42 is a SyQuest removable-cartridge drive with an auto-switching power supply, quiet fan, and built-in surge protection. Comes with a cartridge. The formatting software is powerful but difficult to use. SCSI-ID selection and SCSI termination are external. Documentation is poorly written, \$459. Relax Technology, Inc., 3101 Whipple Rd., Ste. 22, Union City, CA 94587. (415) 471-6112. (Feb '91)

Relax Optical 600 Plus \$11% The Relax Optical 600 Plus is an erasable optical drive with builtin power control, surge protection, noise filtering, and a compact case. Requires Mac Plus or later, \$2,029. Relax Technology, Inc., 3101 Whipple Rd., Ste. 22, Union City,

CA 94587. (415) 471-6112. (Nov

Relax/Pioneer DRM-600 ttt/2 This expensive CD-ROM drive can hold six discs and is well built. Itsperformance is slow, even when you're not jumping between discs. It has good volume control. SCSI-ID selection is done via DIP switches. Internal SCSI termination. \$999. Relax Technology, Inc., 3101 Whipple Rd., Ste. 22, Union City, CA 94587. (415) 471-6112. (June '91)

Rodime Cobra 330e ttt

The Rodime Systems Cobra 330e is a 345-MB hard-disk drive with long seek times, average throughput, and two AC outlets on the rear panel. Requires Mac Plus or later. \$3,999. Rodime Systems, Inc., 901 Broken Sound Pkwy. N.W., Boca Raton, FL 33487, (800) 688-9390 or (407) 994-5585. (Dec '90)

Rodime Cobra 1000e ttt/2

The Rodime Cobra 1000e is a 1gigabyte hard-disk drive with an actual capacity of 990 MB. Has an average seek time of 15 milliseconds. Based on the Seagate ST41200NM mechanism, Provides good performance with the Cobra 1.1.3 SCSI driver. SCSI-ID selection is via external DIP switches. Internal SCSI termination. Includes Redux software for partitioning, password protection, encryption, and backup. \$8,899. Rodime Systems, Inc., 901 Broken Sound Pkwy., N.W., Boca Raton, FL 33487. (800) 688-9390 or (407) 994-5585. (July '91)

Rodime R45 Plus \$\$% This SyQuest removable-cartridge drive lacks software features and has a high list price, but it offers good performance. Its plastic case is relatively flexible. SCSI-ID selection and SCSI termination are external. \$1,399. Rodime Systems, Inc., 901 Broken Sound Pkwy. N.W., Boca Raton, FL 33487. (800) 688-9390 or (407) 994-5585. (Feb '91)

Ruby StarDrive 40DX ttt/2

The Ruby StarDrive 40DX is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. With solid, heavy construction and a low profile, this drive has average performance. SCSI-ID selection is external, but SCSI termination is internal. SCSI-ID switch allows "illegal" numbers 7 through 9. An extra switched AC outlet is provided. \$799. Ruby Systems, Inc., 930 Thomson Pl., Sunnyvale, CA 94086. (800) 888-1668 or (408) 735-8668. (Apr '91) Ruby StarDrive 45RX \$\$\$

The StarDrive 45RX is definitely not the fastest SyQuest removablecartridge drive, but it has excellent documentation with an extensive troubleshooting guide. Not much software is provided, considering the price. The metal case is wellbuilt. \$995. Ruby Systems, Inc., 930 Thomson Pl., Sunnyvale, CA 94086. (800) 888-1668 or (408) 735-8668. (Feb '91)

Stock SA6000 30 ttt

The SA6000 30 hard-disk drive offers an excellent price per megabyte. Not attractive, but everything works. Quiet operation. Automatic head parking. Photocopied manuals. Internal SCSI termination. Requires Mac Plus or later, \$150. Stock International, 1701 Junction Ct., Ste. 301, San Jose, CA 95112, (800) 950-5909 or (408) 437-1000. (Feb '90)

Storage Dimensions 325-S1

ttttt

The Storage Dimensions 325-S1 is a 326-MB hard-disk drive. Short seek times. High throughput rate. Unit is prewired to accept a second mechanism in the same housing. Good for equipping a network server. Requires Mac Plus or later. \$2,999. Storage Dimensions, 2145

Hamilton Ave., San Jose, CA 95125. (408) 879-0300. (Dec '90)

Storage Dimensions

MacinStor 40-ZFP ttt The well-designed MacinStor 40-ZFP is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. Good formatting software is provided, and the drive has a low-profile, elegant case. Unfortunately, the case is somewhat flexible. The drive is moderately expensive. SCSI-ID selection and SCSI termination are external. In our tests, this drive was the fastest of the drives with the same Quantum mechanism, \$859. Storage Dimensions, 2145 Hamilton Ave., San Jose, CA 95125. (408) 879-0300. (Apr '91)

Storage Dimensions MacinStor 650 S1 1111

The MacinStor 650 S1 (formerly called 650 HCV) is a 650-MB external disk drive built around the Maxtor XT-8760S mechanism. Has an access time of 16.5 milliseconds, a transfer rate of 15 MB per second, and an outstanding 40,000-hour MTBF (mean time between failures) rating. Requires Mac Plus or later. \$4,399. Storage Dimensions, 2145 Hamilton Ave., San Jose, CA 95125. (408) 879-0300. (July '90)

Storage Dimensions MacinStor 1020-S1 tttt

The MacinStor 1020-S1 is a 1gigabyte hard-disk drive with an actual capacity of 999 MB. Has an average seek time of 15 milliseconds. Based on the Seagate ST41200NM mechanism. Provides good performance with the MacinStor 3.0 SCSI driver. SCSI-ID selection is via external dial, and SCSI termination uses an external plug. Includes MacTools Deluxe for file recovery, backup, optimizing, password protection, and partitioning software. Mounts all partitions properly under AppleShare. Two-year warranty. Excellent manual. \$6,799. Storage Dimensions, 2145 Hamilton Ave., San Jose, CA 95125, (408) 879-0300. (July '91)

Storage Dimensions MacinStor MCE 880-HC1 \$\$\$\$1/2

The MacinStor MCE 880-HC1 is one of the fastest erasable optical drives for reading data. Unique format of its 1-gigabyte discs can't be read by other manufacturers drives. Can format, read, write, and erase a standard 650-MB cartridge, but performance suffers with these cartridges. Includes Retrospect backup software. Requires Mac Plus or later. \$6,695. Storage Dimensions, 2145 Hamilton Ave., San Jose, CA 95125.(408)879-0300.(Nov '90) * '89 Eddy

Sumo RSSM600-B ttt

The Sumo RSSM600-B is an erasable optical drive. Meager software. Its default format is not ISO. Has an Option-key sequence to format it as ISO standard, Slow, Requires Mac Plus or later. \$4,300. Sumo Systems, 1580 Old Oak-land Rd., Ste. C-103, San Jose, CA 95131. (408) 453-5744. (Nov

Sumo SSER 50 Removable

Because it uses Ricoh's new magnetic-disk-cartridge technology, this drive offers a potentially more durable cartridge design than the older, better established (and incompatible) SyQuest technology. Good for storing and transporting large files, Ricoh 50-MB cartridges may offer better dust resistance. Doesn't match Sy-Quest drivers' speed, however. Good documentation. The Sumo SSER 50 Removable supports A/UX partitions and is bundled with Retrospect software. \$1,300. Sumo Systems, 1580 Old Oakland Rd., Ste. C-103, San Jose, CA 95131. (408) 453-5744. (Feb '91)

SuperMac DataFrame XP330

The SuperMac DataFrame XP330 is a 322-MB hard-disk drive. Offers slow seek times, average throughput, and good software. \$3,399. SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086. (408) 245-2202 or (408) 245-2202. (Dec '90)

Technology Works 3-Meg Static RAM Card 11111 The 3-Meg Static RAM Card is an

excellent, even necessary, addition to the Mac Portable. Uses no extra power and allows maximum operating speed. With true static RAM, the Portable's battery lasts longer in Sleep mode. Easy to install. Lifetime warranty. RAM prices change almost daily. Requires Mac Portable, \$995. Technology Works, 4030 Braker Ln. W., Austin, TX 78759. (800) 688-7466 or (512) 794-8533, (Oct '90)

Tecmar DATaVault \$\$\$\$ The DATaVault is a backup tape unit that uses a Wangtek 4-millimeter DAT mechanism. Transfer rate is 175.96K per second. Requires Mac Plus or later. \$4,995. Tecmar, 6225 Cochran Rd., Solon, OH 44139. (800) 624-8560 or

(216) 349-0600. (July '90) Tecmar THS-2200 \$\$\$\$\$

The THS-2200 is a backup tape drive built around an Exabyte 8millimeter tape mechanism. Average transfer rate is129.21K per second, Requires Mac Plus or later. \$6,995. Tecmar, 6225 Cochran Rd., Solon, OH 44139. (800) 624-8560 or (216) 349-0600. (July '90)

Texel DM5020 \$\$\$

This CD-ROM drive has good volume control and fast Photoshop performance when accessing color images but no preamp output. SCSI-ID selection is done via DIP switches. Has external SCSI termination. No bundled CD-ROMs. \$797. Texel, 1080 E. Duane Ave., Ste. C, Sunnyvale, CA 94086. (800) 348-3935 or (408) 736-1374. (June '91)

Third Wave 45R ttt%

The Third Wave 45R is a SyQuest removable-cartridge drive with an auto-switching power supply, ex-ternal SCSI-ID selection, and external SCSI termination. The drive is bundled with Fontina utilities. 12 MB of shareware, and HyperDeck. \$599. Third Wave Computing, Inc., 1826-B Kramer Ln., Austin, TX 78758. (800) 284-0486 or (512) 832-8282. (Feb '91)

TMS Pro 40 ttt The TMS Pro 40 is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. Average performance. Bundled with basic formatting software and 8 MB of shareware. The plastic case is somewhat flexible. External SCSI-ID selection switch allows "illegal" numbers 7 through 9, and SCSI termination is internal. \$389. TMS Peripherals, 23123 S.W. 58th Ave., Boca Raton, FL 33428. (800) 626-6347 or (407) 482-4034. (Apr '91)

Todd Enterprises TC DR6050

this CD-ROM drive offers good overall performance, even when used with Photoshop. No preamp audio output. Internal SCSI-ID selection and external SCSI termination. AC cable permanently attached. \$995. Todd Enterprises, 224 - 249 67th Ave., Bayside, NY 11364. (800) 445-8633 or (718) 343-1040. (June '91)

Toshiba XM3201A \$\$\$ This solidly built CD-ROM drive offers good performance. It has no preamp output and only limited volume control. SCSI-ID selection is done via DIP switches. External SCSI termination. \$850. Toshiba Information Systems, 9740 Irvine Blvd., Irvine, CA 92718. (800) 456-3475 or (714) 583-3000. (June '91)

Total Peripherals Q40X \$\$\$ The Total Peripherals Q40X is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. The model we tested had a sturdy metal case and good performance. SCSI-ID selection is via external push button or software. However, SCSI termination is internal and SCSI connectors are 25-pin, not the more conventional 50-pin. \$529. Total Peripherals, Inc., 1 Brigham St., Marlboro, MA 01752.(508)460-0764.(Apr '91) Total Peripherals TP-44R \$\$\$

The TP-44R is a SyQuest removable-cartridge drive with an autoswitching power supply, external SCSI-ID selection, and a noisy fan. Performance is above average, but documentation is rudimentary. \$799. Total Peripherals, Inc., 1 Brigham St., Marlboro, MA 01752. (508) 460-0764. (Feb '91)

Tulin A-Hive Hard Drive \$\$\$\$ The Tulin A-Hive Hard Drive is a

1-gigabyte hard-disk drive with an actual capacity of 990 MB. Has an average seek time of 15 milliseconds. Based on the Micropolis 1598-15 mechanism. Provides good performance with the DataWare 1.3b13 SCSI driver, Software provides user-selectable-interleave and partitioning capabilities. SCSI-ID selection is via external DIP switches, and SCSI termination uses an external plug. Choice of 36-inch or 72-Jose, CA 95131. (408) 432-9025. (July '91)

Univation Q50 \$\$1/2

Because it uses Ricoh's new magnetic-disk-cartridge technology, this drive offers a potentially more durable cartridge design than the older, established (and incompatible) SyQuest technology. Good for storing and transporting large files, Ricoh 50-MB cartridges may also offer dust resistance. Doesn't match SyQuest drives' speed, however. The Q50 has rudimen-tary software, and the fan can scrape if the power cable is stressed because of poor positioning. Performance is slow, even for Ricoh drives. \$1,395. Univation, 600 Valley Way, Milpitas, CA 95035. (408) 263-1200. (Feb '91) Western Digital Preference

40AP \$\$%

The Preference 40AP is a 40-MB external SCSI hard-disk drive based on Western Digital's own WD-1006VSCS mechanism. Compact and solidly built, this drive barely missed being the slowest in our April '91 lab report, despite a built-in 32K memory cache. Expensive, considering its performance. SCSI termination is internal. External SCSI-ID selection switch allows "illegal" numbers 7 through 9 plus confusing A through F. \$999 list. Western Digital, 8105 Irvine Center Dr., Irvine, CA 92718. (714) 932-6000 or (714) 932-5000. (Apr '91) Xyxis XY600RW \$\$\$

The Xyxis XY600RW is a slow erasable optical drive. The unit has dynamic partitioning. Requires Mac Plus or later. \$4,995. Xyxis, 14631 Martin Dr., Eden Prairie, MN 55344. (612) 949-2388. (Nov '90)

HYPERMEDIA

101 Scripts and Buttons for HyperCard ttt%

101 Scripts and Buttons for HyperCard is a collection of scripts, buttons, fields, graphics, utilities, XCMDs, XFCNs, icons, cursors, and more for creating HyperCard stacks. Version 1.1 reviewed. Requires Mac Plus or later, HyperCard, and a hard-disk drive. \$49.95. Individual Software, Inc., 125 Shoreway Rd., Ste. 3000, San Carlos, CA 94070. (800) 331-3313 or (415) 595-8855. (June '89)

ADDmotion tttt

ADD motion is an extension to the HyperCard 2.0 development environment that provides a powerful set of animation tools. Animations are created with TimeLines (an editing window) and the Media Controller palette (resembling a VCR), with cels, actors, props, and object paths. Provides its own color-painting and sound tools. ADDmotion's run-time XCMDs are included and can be distrib-uted royalty-free. Not for beginners. Version 1.0 reviewed. Requires HyperCard 2.0, \$295. Motion Works, Inc., 1334 W. Sixth Ave., Ste. 300, Vancouver, British Columbia V6H 1A6, Canada. (604) 732-0289. (July

Authenticate and Mutate #### Authenticate and Mutate are HyperCard extensions. Authenticate is an XFCN that lets you control the contents entered into all fields. It also lets you set the error response - great for database creators. Mutate contains XFCNs for formatting text fields. Authenticate version 2.4, Mutate version 1.0 reviewed. Authenticate, version 2.4, Mutate version 1.0 shipping. Requires HyperCard 1.2 or later or 4th Dimension. \$125. SoftStream International, Inc., 19 White Chapel Dr., Mount Laurel, NJ 08054. (800) 262-6610 or (609) 866-1187. (Jun '90)

BMUG PD-ROM \$\$\$\$ BMUG PD-ROM is a CD-ROM containing 300 MB of shareware, public-domain software, and demoware. Categories include business, education, games, fonts, and Mac II-specific products. Version 1.0 reviewed. Version Volume II shipping. Requires Mac Plus or later and a CD-ROM drive. \$99.95. Discovery Systems, 7001 Discovery Blvd., Dublin, OH 43017, (614) 761-4133. (July '89)

ClubMac CD-ROMs \$\$\$% The ClubMac CD-ROMs each contain 430 to 500 MB of software, including DAs, sounds, editors, word-processing utilities, spreadsheet templates, and 80 MB of stacks. Has user rating system, classified-ad section, and elec-tronic-bulletin-board support. Released quarterly. Fall '88 and Winter '89 reviewed. Requires Mac Plus or later and a CD-ROM drive. Single issue, \$199; annually, \$350. Quantum Access, Inc., 50 Briar Hollow W., Houston, TX 77027. (713) 622-3211. (July '89)

Dialoger Professional tttt Dialoger Professional is a great HyperCard utility for programmers. Easy-to-master palettebased interface lets you build complex dialog boxes. Virtually all the power of the Mac's Dialog Manager is available. Greatly improves appearance and functionality of stacks. Version 1.02 reviewed. Version 2.0 shipping. Requires Mac Plus or later, Sys-tem 6.0.5 or later, and HyperCard

2.0 (hard-disk drive recommended). \$125. theResult Software, Inc., 111 Providence Rd., Chapel Hill, NC 27514. (800) 365-5034 or (919) 490-3292. (Feb '90)

Educorp CD-ROM tests
The Educorp CD-ROM contains approximately 600 MB of shareware, public-domain software, and demoware in 23 categories such as business education, music, and fonts. Has an electronic bulletin-board system. Version 3.0 reviewed. Version 5.0 shipping. Requires HyperCard 1.2 or later. \$199 (two-disc set). Educorp Computer Services, 7434 Trade St., San Diego, CA 92121-2410. (619) 536-9999. (July '89)

Guide \$\$\$\$ Guide is a hypertext tool that lets you easily create complex associative documents. It has no screen-size limitations. A conversion utility lets Macintosh Guide documents run under Windows Guide. Excellent performance, with some limitations. Version 2.0 reviewed. Requires Mac Plus or later. \$295. OWL International, Inc., 2800 156th Ave. S.E., Bellevue, WA 98007. (206) 747-3203. (Apr '90)

HyperAnimator \$\$\$\$ HyperAnimator lets you create talking heads for HyperCard stacks, using MacinTalk or digitized sound resources. Easy to implement for those who know HyperCard well. Version 1.0 reviewed. Version 1.5.2 shipping. Requires Mac Plus or later and HyperCard. \$199.95. Bright Star Technology, Inc., 1450 114th Ave. S.E., Ste. 200, Bellevue, WA 98004. (206) 451-3697. (Feb '89)

HyperBASIC \$\$\$\\\^{\bar{2}}\tag{HyperBASIC is a stand-alone} XCMD-compiler application. You must be able to program in BASIC to use it. Its BASIC is pretty standard and gives access to 352 Toolbox traps. There's no debugging ability worth using, and the manual is poor. This is not a good system for HyperCard XCMD creation. Version 1.05 reviewed. Version 1.20 shipping. Requires Mac Plus or later, HyperCard 1.2.1 or later, and a harddisk drive. \$99. Teknosys, Inc., 3923 Coconut Palm Dr., Ste. 111, Tampa, FL 33619. (800) 873-3494 or (813) 620-3494. (May '90) HyperCard \$\$\$\$%

With the exception of the lack of support for color and object graphics, HyperCard 2.0 is a huge improvement over earlier versions. There are some nice additions to graphics capabilities. Text formatting, text handling, and printing are significantly improved. More than one stack can now be open at a time. Version 2.0 reviewed. Version 2.1 shipping. Requires Mac Plus or later and System 6.0.5 (hard-disk drive and

2 megabytes of RAM recom-

mended). Upgrade kit, \$49; de-

velopment kit, \$199. Claris Corp., 5201 Patrick Henry Dr., Santa Clara, CA 95052. (800) 544-8554 or (408) 727-8227. (Dec '90) * '87 Eddy

HyperDA tttt

HyperDA lets you browse through HyperCard stacks via a DA. Lets 512K Macs access stackware. Doesn't support global variables. Version 1.2.2 reviewed. Version 2.0 shipping. Requires Mac 512K or later. \$129; upgrade, \$29. Symmetry Software Corp., 8603 E. Royal Palm Rd., Ste. 110, Scottsdale, AZ 85258, (800) 624-2485 or (602) 998-9106. (May

HyperHIT \$\$\$%

HyperHIT is a set of HyperCard XFCNs and XCMDs that lets you build database applications in HyperCard. Has many powerful functions and tools. HyperTalk experience is required. Results can be slow. Version 1.0 reviewed. Version 3.0 shipping. Requires Mac Plus or later and HyperCard. \$195.95 plus license fees for commercial use. SoftStream International, Inc., 19 White Chapel Dr., Mount Laurel, NJ 08054. (800) 262-6610 or (609) 866-1187. (Jan '90) HyperTMON \$\$\$\frac{1}{2}\$

HyperTMON is the first true HyperTalk debugger. This XCMD is good but needs some work. Has trouble stepping through some HyperTalk code and has a few command incompatibilities. Was not tested with HyperCard 2.0. Version 1.0 reviewed. Requires Mac Plus or later and HyperCard. \$99.95. ICOM Simulations, Inc., 648 S. Wheeling Rd., Wheeling, IL 60090. (708) 520-4440. (Apr

HyperTutor tttt/2

HyperTutor is a stack that teaches HyperTalk, HyperCard's programming language. Uses an interactive Test Mac on each card to write scripts. A variety of windows makes it good for both beginners and advanced programmers. Not tested with HyperCard 2.0. Version 1.12 reviewed. Requires Mac Plus or later and HyperCard 1.1 or later (hard-disk drive recommended). \$49.95. Power Up Software Corp., 2929 Campus Dr., San Mateo, CA 94403. (800) 851-2917 or (415)

345-5900. (Apr '88) The Macintosh Bible:

STAX! Edition \$\$\$
The Macintosh Bible: STAX! Edition is the HyperCard version of the first edition of The Macintosh Bible. Covers System software, applications, hardware, and consumer advice. Version 1 reviewed. Requires Mac Plus or later with external 800K floppy drive (hard-disk drive recommended), and HyperCard. \$39.95. STAX! to the Mac, 8008 Shoal Creek Blvd., Austin, TX 78758. (512) 467-4550. (Mar '89)

MindLink ttt%

MindLink is a HyperCard-based idea processor. It leads you through a structured procedure that helps you find answers by prompting you with questions. Performance can be frustrating. HyperCard is bundled. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later and a hard-disk drive or two floppy-disk drives. Student version, \$79.95; professional version, \$299. MindLink, Inc., P.O. Box 247, North Pomfret, VT 05053. (802) 457-2025. (May '90)

Nutrition \$\$\$%

Nutrition is a HyperCard-stack nutritional record keeper. The nutritional database needs more information, and adding new information is difficult. Includes conversion calculator. Version 2.0 reviewed. Version 2.09 shipping. Requires Mac Plus or later with hard-disk drive and HyperCard 1.2 or later. \$79. Big Byte Software, 25 Blake St, Needham, MA 02192. (617) 444-3028. (Apr '90)

Nuts & HyperBolts ### Nuts & HyperBolts is a series of large HyperCard stacks for improving your grammar. Works with the mouse only; no keyboard shortcuts. Version 2.0 reviewed. Requires Mac Plus or later and HyperCard. \$189.95 for five-disk set. Sterling Swift Software, P.O. Box 43325, Austin, TX 78745-0009. (512) 280-2431. (Aug '90) Reports 2.0 \$\$\frac{1}{2}\$\

Reports 2.0 fills the gap left by HyperCard's limited report-generation ability by delivering powerful database-reporting capabilities to HyperCard 2.0 users. You can create report layouts, choose any HyperCard-based record selection and sorting criteria, and print the results. Reports 2.0 is several applications in one package: a layout editor, a card selector (within stacks), and a viewing and editing system (thanks to the MasterView application included). Version 2.0 reviewed. Requires Mac Plus or later, System 6.0.3 or later, and HyperCard 2.0v2 (included) or later, \$149.95. Nine To Five Software, 3360 Mitchell Ln., Ste. 105, Boulder, CO 80301. (800) 292-5925 or (303) 443-4104. (June '91)

Reunion ####

Reunion is a good genealogy program. HyperCard-based. Supports GEDCOM. Includes space for adding digitized photos, an index, and a birthday file. A complex program with an excellent manual. Easy to use. Version 1.5 reviewed. Version 2.0 shipping. Requires Mac Plus or later, System 6.0.4 or later, and HyperCard. \$149. Leister Productions, 14 Hill Blvd., Mechanicsburg, PA 17055. (717) 697-1378. (Oct '90)

ScriptEdit \$\$\$\$

ScriptEdit is a HyperTalk utility for HyperCard programmers.

Opens multiple script windows simultaneously from different stacks. Makes stack creation easier and more convenient than previously possible. Version 1.0 reviewed. Version 1.1 shipping. Requires Mac Plus or later. \$79. Somak Software, Inc., 535 Encinitas Blvd., Ste. 113, Encinitas, CA 92024. (800) 842-5020 or (619) 942-2556. (Feb '90)

ScriptExpert ### ScriptExpert is the HyperTalk helper for constructing HyperCard scripts. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later and HyperCard 1.2.5 or 2.0 (package includes software for both versions). \$99.95. Hyperpress Publishing Corp., 1166-F Triton St., Foster City, CA 94404. (800) 633-4252 or (415) 345-4620. (Oct '88)

Spinnaker PLUS ttt Spinnaker PLUS is a HyperCardlike development environment. Uses concept of hypertext but with limitations. Good use of object graphics and color. Has unique specialized fields for word-processing and database text. Supports multiple platforms. Version 2.0 shipping. Requires Mac Plus or later, System 6.0.3 or later, and 2 MB of RAM. \$495. Spinnaker Software Corp., 201 Broadway, Cambridge, MA 02139. (800) 323-8088 or (617) 494-1200. (Dec

SuperCard tttt

SuperCard offers capabilities that HyperCard lacks. An excellent tool for developing animated presentations and other graphically rich applications. Its control over the interface and its ability to produce stand-alone applications distinguish it from any dedicated animation or presentation product. Development environment has improved significantly. Version 1.5 shipping. Requires Mac Plus or later and System 6.0.4 or later (2 MB of RAM recom-mended). \$299. Aldus Corp., 411 First Ave. S., Seattle, WA 98104. (800) 333-2538 or (206) 628-2320. (Dec '90)

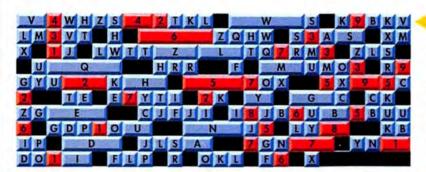
Time Table of History: Science and Innovation ###/2

Time Table of History: Science and Innovation presents events from the history of technology on a HyperCard-based CD-ROM. Text, graphics, and sound are nicely integrated, and related events are well linked. Includes HyperCard. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later, HyperCard 1.2.5 or later, and a CD-ROM drive. \$185. Xiphias, 8758 Venice Blvd., Los Angeles, CA 90034. (213) 841-2790. (May '89)

Wild Things \$\$\$\$ Wild Things is a set of 40 XCMDs that also teaches you about XCMDs. Comes on four disks two are devoted entirely to source code. Code is provided in Pascal

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(MPW, TML, and Lightspeed), C (MPW and Lightspeed), and FORTRAN (MPW) for each of the 40 XCMDs. Includes Hyper-Card 1.2.1. Version 1.1.1 ship-ping. Requires Mac Plus or later, System 6.0.3 or later, and a harddisk drive. \$150. Language Systems Corp., 441-B Carlisle Dr., Herndon, VA 22070. (703) 478-0181. (Dec '89)

The Vietnam War 1111

The Vietnam War is a stack that uses HyperCard fully and brilliantly to provide an excellent history through the use of sounds, animation, generally superior graphics, and unobtrusive but extensive links. Its only drawbacks are those inherent in HyperCard. Version 2.0 reviewed. Version 2.1 shipping. Requires Mac Plus or later, HyperCard 2.0, and a harddisk drive. \$24.95. Regeneration Software, 377 Collado Dr., Scotts Valley, CA 95066. (408) 438-5791. (Apr '90) XCAL \$\$\$\frac{1}{2}\$

XCAL is a set of HyperCard externals that add calculation and spreadsheetlike abilities to stacks. Grids restricted to the size of single cards. Extends HyperCard's math abilities significantly. Poor manual. Version 2.0 shipping Requires Mac Plus or later (2 MB recommended), HyperCard (in-cluded), and a hard-disk drive. \$149.95. Trendware Corp., P.O. Box 2285, Huntington, CT 06484. (203) 926-1116. (Jan '90)



Audiomedia tttt

Audiomedia turns the Mac into a self-contained digital recording studio. Can play back, edit, and mix sound files and subject them to a variety of special effects. Has CD-quality sound that occupies huge amounts of hard-disk space (10 MB of disk space per minute of sound). Excellent manual includes a chapter devoted to scientific sound theory. Version 2.02 shipping. Requires Mac II series, 2 MB of RAM, and a harddisk drive. \$995. Digidesign, 1360 Willow Rd., Ste. 101, Menlo Park, CA 94025. (415) 688-0600. (Oct '90) * '89 Eddy

Computer Friends ColorSnap

32+ \$\$\$\$%

The Computer Friends ColorSnap 32+ is a NuBus card that digitizes single frames of video input. Above-average image quality. Software is powerful, complete, and easy to use. Provides image cataloging plus plug-ins for Photoshop and QuarkXPress. Video-in options include composite, RGB, and S-video. Livevideo display is slow and uses a small window; 24-bit images can be digitized, but resolution is 640 x 480 pixels. Requires Mac II series. \$995. Computer Friends, Inc., 14250 N.W. Science Park Dr., Portland, OR 97229. (800) 547-3303 or (503) 626-2291. (July

E-Machines QuickView Studio

The Quick View Studio is a NuBus card that sequentially digitizes multiple frames of video input. Poor image quality but nice software interface. Video-in options include composite, RGB, and Svideo. Live-video display is slow and uses a small window; 16-bit live video is slower than 30 fps. Resizable images (8- or 16-bit) can be digitized. Requires Mac II series. \$2,495. E-Machines, Inc., 9305 S.W. Gemini Dr., Beaverton, OR 97005. (800) 344-7274 or (503) 646-6699. (July '91)

FilmMaker \$\$\$\$

FilmMaker is a powerful animation tool that includes five separate applications: Mark, Animate, Color, Sound, and Present. It is limited to the animation process, so the original graphic images that become sequential frames in FilmMaker must be created in a painting or 3-D program and then imported as PICT, PICS, or EPS files. The program isn't optimized for precisely registered frame animation. Also, the interface seems incomplete and awkward. Version 2.0.1 reviewed. Requires Mac II series with 5 MB of RAM. a hard-disk drive, and 32-bit QuickDraw. \$695. Paracomp, Inc., 1725 Montgomery St., San Francisco, CA 94111. (415) 956-4091. (Apr '91) ★ '90 Eddy interFACE \$\$\$\$\$

interFACE is a good tool for building interactive educational software. At first the program seems dedicated to creating animated "talking heads" with facial gestures synchronized to speech or other sounds. However, interFACE lets you build interactive programs, using recorded sounds and bit-mapped graphics. The program can create speech by using text input and MacinTalk or by synchronizing sounds from Farallon's MacRecorder. Version 1.0 reviewed. Requires Mac Plus or later with 2 MB of RAM. \$499.95. Bright Star Technology, Inc., 1450 114th Ave. S.E., Ste. 200, Bellevue, WA 98004. (206) 451-3697. (Feb '91)

MacRecorder Sound System \$\$\$\$%

The MacRecorder is an audio digitizer that can add sounds to your system, animations, or HyperCard stacks. Supports an extensive array of audio-manipulation effects. HyperSound Tool-kit makes adding sounds to HyperCard stacks easy. Version 2.0 reviewed. Version 2.0.3 shipping. Requires Mac Plus or later; HyperSound Toolkit requires HyperCard 1.2.1 or later. \$249. Farallon Computing, Inc., 2000 Powell St., Ste. 600, Emeryville, CA 94608. (415) 596-9000. (Jan '90)

MacroMind Accelerator 1111

MacroMind Accelerator compiles MacroMind Director movies to make them run more smoothly. Version 1.0 reviewed. Version 2.01 shipping. Requires Macro-Mind Director (hard-disk drive recommended). \$195; upgrade from Version 1.0 (VideoWorks accelerator), \$50. MacroMind, Inc., 410 Townsend St., Ste. 408, San Francisco, CA 94107. (415) 442-0200. (Dec '88)

MacroMind Director \$\$\$\$\%

MacroMind Director is unequaled for its combination of interactivity with animated playback of color graphics and sound. By writing routines in Director's scripting language, you can develop interactive animations and also control peripheral devices such as CD-ROM drives, VCRs, and video-disc players. One problem is that its excellent paint-layer tools create bit-mapped images only (except text), so a separate drawing layer would help. Anyone fa-miliar with HyperTalk scripting or similar programming should have no problem with Director. Version 2.0 reviewed. \$895. MacroMind, Inc., 410 Townsend St., Ste. 408, San Francisco, CA 94107. (415) 442-0200. (Mar '91) ★ '89 Eddy

Mass Microsystems QuickImage 24 111/2

The QuickImage 24 is an inexpensive NuBus card that digitizes single frames of video input. Poor color fidelity. Software is easy to use and provides special-effects filters. Video-in options include composite and S-video but not RGB. Live-video display is slow and uses a small window; 24-bit images can be digitized, but maximum resolution is 640 x 480 pixels. Requires Mac II series. \$995. Mass Microsystems, Inc., 810 W. Maude Ave., Sunnyvale, CA 94086. (800) 522-7979 or (408) 522-1200. (July '91)

Media Letter \$\$\$\$%

Media Letter is a monthly publication that covers interactive and multimedia technologies. It includes both basic and advanced material and seems aimed at users of these technologies rather than at developers. Founding editor Denise Caruso has assembled an excellent group of contributing writers. Topics covered include ethical issues, application notes, and some good opinion pieces. \$395 per year; \$95 for schools and non-profits. The Myriad Group, P.O. Box 5199, Belmont, CA 94002. (415) 626-5426 or (415) 856-8900. (Oct '90)

MediaTracks \$\$\$\$%

MediaTracks (formerly called ScreenRecorder) is a utility for recording your on-screen Mac activities. Ideal for presentations and training. Uses a tape-recorder model; "tapes" can include sounds recorded with digitizers such as

MacRecorder and can be a fixed length or loop. Recordings can be installed into HyperCard stacks for easier distribution. Version 1.0 reviewed. Requires Mac Plus or later, \$495. Farallon Computing, Inc., 2000 Powell St., Ste. 600, Emeryville, CA 94608. (415) 596-

9000. (Dec '90)
Neotech Image Grabber and
Colour Adapter Module 1113
Neotech Image Grabber is a NuBus card that digitizes single frames of still-video input. Excellent image quality. Outputs grayscale NTSC video. The Colour Adapter Module is an optional external box that adds color capability. The bundled software is powerful, but complex. Video-in options include composite, RGB, and S-video. Live-video display uses resizable 640-x-480-pixel window; 24-bit images can be digitized, but resolution is still 640 x 480 pixels. Requires Mac II series. Image Grabber, \$1,499; Colour Adapter Module, \$499. Advent Computer Products, Inc., 449 Santa Fe Dr., Ste. 213, Encinitas, CA 92024. (619) 942-8456. (July '91) RadiusTV ‡‡‡

The RadiusTV is a NuBus card with a tuner that can pick up broadcast and cable TV. Accepts audio from TVs, VCRs, and vid-eodisc players. Clear, accurate image quality. Limited software. Video-in options include composite, RF, and RGB. Live-video display in 8- or 16-bit mode only; 8- or 16-bit images can be digitized. Can read and capture closedcaptioned text and can display fullmotion video at 30 fps. Audio can fall out of sync with video, because of NuBus data-transfer limitations. Requires Mac II series. \$2,795. Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131. (800) 227-2795 or (408) 434-1010. (July

'91) * '90 Eddy ShowCase F/X ttt

ShowCase F/X is an animatedtitling package that provides several textual effects - including Aegis' own Poly fonts making title sequences. Provides a good introduction to tweening and frame-by-frame animation. You can't export ShowCase sequences into other animation packages or import sequences into ShowCase. Reads PICT files only. Version 1.0 reviewed. Requires color Mac II series with 2 MB of RAM. \$395. Aegis Development, 2210 Wilshire Blvd., Ste. 277, Santa Monica, CA 90403, (800) 345-9871 or (213) 392-9972. (Dec

TV Producer Pro \$\$\$

The TV Producer Pro is a NuBus card that overlays Mac graphics and text onto a video signal. Original software was clumsy to use, but new version will provide access via control panel. Version 1.8 software shipping. Requires





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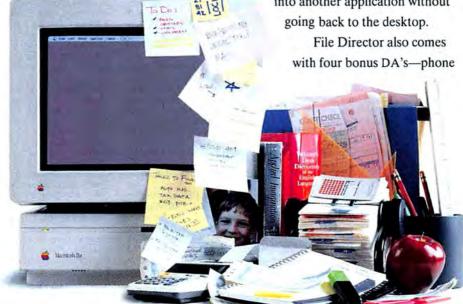
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Pyro!,™ the entertaining screen saver (a \$39.95 value), just for writing "Pyro!" on the File Director registration card before you return it. For more information, call 1-800-873-4384 today.

File Director from Fifth Generation Systems, Inc.

Mac II, Apple 8-bit-video card, and video source. \$695. Computer Friends, Inc., 14250 N.W. Science Park Dr., Portland, OR 97229. (800) 547-3303 or (503) 626-2291. (May '88) VideoLogic DVA-4000 \$\$\$\$\%

The DVA-4000 is a NuBus card that provides a complete set of audio/video features for multimedia. Excellent image quality. Software is powerful, complete, and easy to use. Provides stereo audio that's controllable through software. Video-in options include composite, RGB, and S-video. Live-video display is 24-bit in a resizable window; 8-bit or 24-bit images can be digitized. Easily integrates with multimedia packages such as HyperCard, Macro-Mind Director, and Authorware Professional. Good documentation. Requires Mac II series. \$2,995. VideoLogic, Inc., 245 First St., Cambridge, MA 02142. (617) 494-0530. (July '91)

Music

Alchemy tttt

Alchemy loads and edits digitally sampled sounds from most commercial samplers. Can work with any sampler. Excellent manual, Version 2.23 shipping. Requires Mac Plus or later with 2 MB of RAM, MIDI or RS-422 interface. and sampler, \$695, Passport Designs, Inc., 625 Miramontes St., Ste. 103, Half Moon Bay, CA 94019. (415) 726-0280. (Oct '88) * '88 Eddy

Apple MIDI Interface ttt

The Apple MIDI Interface is a simple musical-instrument digital interface with a 1-MHz clock rate. Has only one MIDI input and one output. Requires Mac Plus or later. \$99. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (June '88)

Beyond \$\$\$\$

Beyond is a competent music sequencer for midlevel users, but it should be priced around \$200 to make it competitive. Does a good job of implementing the Mac interface, and both the manual and the tutorial are excellent. Incorporates a unique feature that, at least on Macs based on a 68000 CPU, accelerates the program by adjusting its performance relative to the computer's internal clock. Version 1.5 reviewed, Version 2.0 shipping. Requires Mac Plus or later, MIDI interface, and MIDI synthesizer. \$319. Dr. T's Music Software, Inc., 100 Crescent Rd., Ste. 1B, Needham, MA 02194. (617) 455-1454. (Feb '91

ConcertWare+ MIDI ***

ConcertWare+ MIDI is a composition and transcription program that can record multiple notes from a MIDI keyboard. Easy to use if you can read music. Handles eight tracks of eight voices each. Ver-

sion 4.0 reviewed. Version 5.1 shipping, Requires Mac 512Ke or later, \$189,95. Great Wave Software, 5353 Scotts Valley Dr., Ste. E, Scotts Valley, CA 95066. (408) 438-1990. (Dec '87)

Cue: The Film Music System

Cue: The Film Music System is a powerful and versatile assistant for scoring films. Automates spotting and logging cue points and searching for matching tempos. Also performs many minor jobs, such as generating a performing-rights cue sheet. Version 2.0 reviewed. Version 3.0 shipping. Requires Mac 512Ke or later (hard-disk drive recommended). \$595. Opcode Systems, Inc., 3641 Haven Dr., Ste. A. Menlo Park, CA 94025. (415) 369-8131. (Feb

Deck tttt

Deck is a completely softwaregenerated recording system, with an interface resembling the famous Tascam PortaStudio fourtrack cassette recorder, MIDI and acoustic input can be mixed and sychronized, producing CDquality stereo that's easy to access and manipulate. Version 1.0 reviewed. Version 1.03 shipping. Requires Digidesign's Audio-media or Sound Tools card. \$349. Digidesign, 1360 Willow Rd., Ste. 101, Menlo Park, CA 94025. (415) 688-0600. (Feb '91) '90 Eddy

Deluxe Music Construction

Set 1111 Deluxe Music Construction Set lets you enter up to 48 voices on eight staves and play the music through the Mac's internal speaker and/or via MIDI. Copy-protected. Version 2.0 reviewed. Version 2.5 shipping. Requires Mac Plus or later (hard-disk drive recommended). \$129.95. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. (800) 245-4525 or (415) 571-7171. (June '88)

Digidesign MacProteus tttt/2 The MacProteus is a NuBus card that fits any member of the Mac II series. The card operates as a sampling sound synthesizer for desktop music production, pro-viding a MIDI interface with Apple's MIDI Manager and PatchBay software. A wide variety of customizable sounds is available, and the card is easy to install. Can play 16-bit linear, 39kHz mono or stereo samples, but it cannot create them. Version 1.0f2 reviewed. Requires Mac II series. \$895. Digidesign, 1360 Willow Rd., Ste. 101, Menlo Park, CA 94025. (415) 688-0600. (Feb '91) * '90 Eddy

Encore tttt/2

Encore is a quasi-rule-based music-notation program with a nice interface. It supports multiple files and can deal with large scores. Version 1.1.6a reviewed. Version 1.31 shipping. Requires Mac Plus

or later. \$595. Passport Designs, Inc., 625 Miramontes St., Ste. 103, Half Moon Bay, CA 94019. (415) 726-0280. (May '90)

EZ Vision \$\$\$\$%

Powerful enough for beginners, EZ Vision is a general-purpose sequencer that uses a standard tape-recorder analogy, offering many of the best features in OpCode's professional sequencer, Vision. Works with Apple's MIDI Manager but doesn't recognize SMPTE time code. EZ Vision makes good use of color and allows audible output while fastforwarding or rewinding. Version 1.0 reviewed. \$149. Opcode Systems, Inc., 3641 Haven Dr., Ste. A, Menlo Park, CA 94025. (415) 369-8131. (Feb '91)

Finale \$\$\$\$%

Finale 2.0 is a complex, revolutionary music-notation program. It packs power and a muchimproved interface and manuals. It's best suited for users needing absolute control over all the music elements in large-scale compositional and/or publishing projects. The new version fixes many of 1.0's flaws and has a more reasonable price. The four new manuals are excellent, and performance is fast. Offers page and score views. Version 2.0 reviewed. Version 2.5 shipping. Requires Mac Plus or later, MIDI instrument and interface, a harddisk drive, and a printer. \$749. Coda Music Software, 1401 E. 79th St., Bloomington, MN 55425. (800) 843-2066 or (612) 854-1288. (May '90)

Galaxy \$\$\$\$%

Galaxy is a universal patchlibrarian program for MIDI synthesizers. When instruments are organized in a bundle, an entire Galaxy setup can be loaded with one command. Auditions and organizes individual patches from a bundle or by separate patch banks. Has many extra features, is easy to use, and allows connection to Vision (Opcode's professional sequencing program). Version 1.0 reviewed. Version 1.0.2 shipping. \$249. Opcode Systems, Inc., 3641 Haven Dr., Ste. A, Menlo Park, CA 94025. (415) 369-8131. (Nov

Harmony Grid tttt/2

Harmony Grid offers an experiential approach to harmony theory. Uses a grid to show scales and chords as repeating patterns. Users play tones by moving the mouse over the grid, resulting in improvisation without requiring any training or technique. The program automatically provides counterpoint. Supports MIDI. Version 1.05 shipping. Requires Mac Plus or later (MIDI synthesizer recommended). \$99. VPL Research, Inc., 656 Bair Island Rd., Third Floor, Redwood City, CA 94063. (415) 361-1710. (Aug Jam Session 1111

Jam Session is a music program for those who think MIDI refers to the length of skirts. With no any skill, you can "jam" with rock, jazz, rap, or country tunes. A sort of "Sing Along with Mitch" for the computer crowd. Version 1.1 reviewed. Requires Mac Plus or later. \$49.95. Brøderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903. (800) 521-6263 or (415) 492-3200. (July '88)

Listen ttt

Listen is an educational tool for ear training. It offers a piano keyboard and a guitar fret board to input notes. Wide range of exercises. Supports MIDI, Version 2.1 reviewed. Requires Mac Plus or later and System 6.0.3 or later. \$99. Imaja, P.O. Box 6386, Albany, CA 94706. (415) 526-4621. (Jan '87)

M ttt

M is a music-composition and -creation program that works with MIDI data in real time. Unique, entertaining, and powerful but requires lots of practice and patience. Version 2.2 shipping. Requires Mac Plus or later, MIDI interface, and MIDI synthesizer. \$179. Dr. T's Music Software, Inc., 100 Crescent Rd., Ste. 1B, Needham, MA 02194. (617) 455-1454. (Oct '87)

The Magic Flute Audio Notes ***

The Magic Flute Audio Notes gives a thorough introduction to Mozart's opera. Nonintuitive interface, but it's manageable. Attractive graphics. Somewhat difficult to install. Requires Mac Plus or later, System 6.0.3 or later, a hard-disk drive, a CD-ROM drive, and speakers or headphones, \$66. Warner New Media, 3500 W. Olive Ave., Ste. 1050, Burbank, CA 91505. (818) 955-9999. (Nov

Master Tracks PRO 4 \$\$\$\$%

Master Tracks PRO 4 is a fullfeatured second-generation MIDI sequencer. Adheres to the Mac interface. Has graphics-controller editing. Not copy-protected. Version 3.3 reviewed. Version 4.5 shipping. Requires Mac Plus or later. \$495; Trax 2.0, \$99. Passmci. \$493; 1rax 2.0, \$99. Passport Designs, Inc., 625 Miramontes St., Ste. 103, Half Moon Bay, CA 94019, (415) 726-0280. (Dec '87)

MIDIBASIC \$15

MIDIBASIC is a simple but highly useful routine for writing MIDI software. Sketchy documentation. Works with both Microsoft BA-SIC and ZBASIC. Version 1.0 reviewed. Version 3.0 shipping. Requires Mac Plus or later, BA-SIC, and MIDI interface. \$99.95. Altech Systems, 122 Faries Industrial Park Dr., Shreveport, LA 71106. (318) 868-8036. (Aug '87) MIDIplay \$\$\$\$%

MIDIplay is a HyperCard stack that successfully accomplishes the

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ambitious task of integrating MIDI sequences into Mac-based multimedia presentations. The XCMDs provided in this stack work with HyperCard, SuperCard, and MacroMind Director. MIDIplay's main job is to export MIDI music and files to HyperCard buttons, other stacks, or the Clipboard, but it can also export many of its own sound-control buttons (such as Start, Continue, and Stop) to other stacks. Other goodies let you finetune overall characteristics of MIDI sounds. Version 1.0 reviewed. \$59.95. Opcode Systems, Inc., 3641 Haven Dr., Ste. A, Menlo Park, CA 94025. (415) 369-8131. (May '91) Music Mouse \$\$\$\$\$

Music Mouse is a program that gives you instant musical feedback as you move the mouse and type on the keyboard, thus controlling tempo, vibrato, volume, and so on. Version 1.0 reviewed. Version 2.04 shipping. Requires Mac Plus or later. \$79. Dr. T's Music Software, Inc., 100 Crescent Rd., Ste. 1B, Needham, MA 02194. (617) 455-1454. (May '87)

MusicProse \$\$\$\$

MusicProse was designed for preparing lead sheets, piano-vocal parts, and small ensemble scores. It's easy to learn and use. Can import and play back almost anything. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later with a hard-disk drive, MIDI instrument and interface, and printer. \$399. Coda Music Software, 1401 E. 79th St., Bloomington, MN 55425. (800) 843-2066 or (612) 854-1288.

NoteWriter II \$\$\$\$

NoteWriter II is a completely nonrules-based notation program. Doesn't read, write, or understand MIDI and doesn't play back files. Does give tremendous control over how music looks on the page. Can show scores exactly they way they'll print. Good for working with unusual music symbols. Version 2.5 reviewed. Version 2.69 shipping. Requires Mac Plus or later. \$595. Passport Designs, Inc., 625 Miramontes St., Ste. 103, Half Moon Bay, CA 94019. (415) 726-0280. (Sept '90)

Perceive ttt

Perceive is a multipart musictraining package aimed at the school environment. Contains six modules of varying quality — Tutor, Drills, MiniDesignWave, MiniWaveDraw, Sound Machine, and Tuning. Requires Mac 512K. Plus, or SE. \$99. Coda Music Software, 1401 E. 79th St., Bloomington, MN 55425. (800) 843-2066 or (612) 854-1288. (Mar

Performer tttt

Performer is a full-featured MIDI sequencer that includes looping, SMPTE syncing, 32 simultaneous Ins and Outs, unlimited overdubbing, and compatibility with Professional Composer for transcription. Version 2.2 reviewed. Version 3.61 shipping. Requires Mac Plus or later with 2 MB of RAM, System 6.0.3 or later, MIDI interface, and two floppy drives (harddisk drive recommended). \$495; MIDI Time Piece interface, \$495. Mark of the Unicorn, 222 Third St., Cambridge, MA 02142. (617) 576-2760. (Jan '88)

Practica Musica \$\$\$\$\$

Practica Musica uses an interactive game and practice approach to teach music theory and ear training. Excellent training tool for serious music study as well as for developing a trained ear for intervals, chords, and melodies. Includes simple pitch reading and writing, scales, modes, interval recognition, and chord spelling. Supports MIDI. Version 2.2 shipping. Requires Mac Plus or later. \$125. Ars Nova Software, P.O. Box 637, Kirkland, WA 98083. (800) 445-4866 or (206) 889-0927. (Aug '90) ★ '87 Eddy Professional Composer \$\$%

Professional Composer produces performance-quality sheet music, using Adobe's Sonata font. Scores can be created from scratch or imported from Performer (and can be exported to Performer for MIDI playback). Copy-protected. Version 2.3 shipping. Requires Mac Plus or later, System 6.0.3 or later, and two floppy drives (hard-disk drive recommended). \$495. Mark of the Unicorn, 222 Third St., Cambridge, MA 02142. (617) 576-2760. (Jan '88)

SampleCell \$\$\$\$\$

The SampleCell is a sampleplaying Mac II NuBus card. Comes with excellent software tools and more than 600 MB of prerecorded sounds on a CD-ROM. Hardware comprises a SIMM-less NuBus card socketed for 8 MB of RAM. The card can store up to 100 seconds of 16-bit sound sampled at 44.1 KHz. Significantly cuts cost of highquality sound processing by using the Mac's CPU. Doesn't supply recording capability. You can use as many SampleCells as the Mac will hold. Each card runs 16 MIDI channels. Supports MIDI keyboards, sequencers, and programs compatible with Apple's MIDI Manager. Highly flexible and expandable. Version 1.1 reviewed. Version 1.2 shipping. Requires Mac II series and a hard-disk drive; CD-ROM drive required for included disc. \$1,995 with no installed RAM. Digidesign, 1360 Willow Rd., Ste. 101, Menlo Park, CA 94025. (415) 688-0600. (July

The String Quartet \$555

Warner New Media's second Audio Notes CD-ROM provides an ideal introduction to Beethoven's String Quartet No. 14, Op. 131. Compared with the earlier disc (Mozart's The Magic Flute), The String Quartet is much easier to install and to navigate. The graphic design is well suited to HyperCard's intuitive style. Requires Mac Plus or later, HyperCard 1.2.5, hard-disk drive, CD-ROM drive, and speakers or headphones. \$66. Warner New Media, 3500 W. Olive Ave., Ste. 1050, Burbank, CA 91505. (818) 955-9999. (Mar '91)

Studio Session \$\$\$\$%

Studio Session consists of two programs - Editor and Player that produce music with six voices of digitized sound. Excellent program and manual. \$89.95. Bogas Productions, 151 Twenty-Fourth Ave., San Francisco, CA 94121. (415) 673-2532. (Aug '87) * '86 Eddy

Studio Vision \$\$\$\$%

Studio Vision is the first software package that seamlessly integrates MIDI data with digital audio recording. It lets you record vocals or non-MIDI instruments in the same document as MIDI data and then play it back along with the music. Actually an extension of Vision (Opcode's top-of-the-line MIDI sequencer), Studio Vision adds 16 tracks of audio data (assignable to 2 channels) to Vision's 99 tracks (assignable to 32 MIDI channels). Time can be notated in musical terms (bars/beats/units) or in video terms (hours/minutes/ frames), with SMPTE locking. Version 1.21 reviewed. \$995. Opcode Systems, Inc., 3641 Haven Dr., Ste. A, Menlo Park, CA 94025.(415)369-8131.(June '91)

Super Librarian \$\$\$% Super Librarian is a multiplatform universal patch librarian for MIDI synthesizers. Organizes different groups of instruments or different banks of a single instrument into a performance. Buttons for sending and receiving patch information are inside each Device Folder rather than on a menu. Allows transfer of patches from one type of computer to another as long as the same profile is loaded into each machine. Un-Mac-like interface. Version 1.4 reviewed. Version 3.0 shipping. \$99. Pixel Publishing, 641 Caledonia Rd., Toronto, Ontario M6E 4V8, Canada. (416) 785-3036. (Nov '90)

Turbosynth \$\$\$\$\$

Turbosynth creates sounds for a digital sampler, using modularsynthesis techniques. Good harmonic spectral inverter. Lacks an easy method of multisampling. Version 2.0 shipping. Requires Mac Plus or later, sampler, and MIDI interface. \$349. Digidesign, 1360 Willow Rd., Ste. 101, Menlo Park, CA 94025. (415) 688-0600. (Oct '88)

UpBeat \$\$\$%

UpBeat turns the Mac into a front panel for a highly complex and versatile drum machine. Input patterns with mouse, MIDI key-

board, or drum machine. Version 1.2 reviewed. Version 2.05 shipping. Requires Mac Plus or later, MIDI interface, and MIDI synthesizer. \$199. Dr. T's Music Software, Inc., 100 Crescent Rd., Ste. 1B, Needham, MA 02194. (617) 455-1454. (May '88)

Vision \$\$\$\$%

Vision is a Mac sequencer that supports full SMPTE control, event-list and graphics editing; real-time and step recording; looping; tempo, meter, and dynamic changes; and standard MIDI files. MIDI Keys maps certain Mac keyboard commands to your MIDI controller. Faders window supports 32 faders, offering real-time control of volume. tempo, and synthesizer-specific functions. Copy-protected. Version 1.01 reviewed. Version 1.2 shipping. Requires Mac Plus or later, MIDI interface, and MIDI synthesizer. \$495. Opcode Systems, Inc., 3641 Haven Dr., Ste. A, Menlo Park, CA 94025. (415) 369-8131. (Dec '89) The Voyager CD AudioStack

The Voyager CD AudioStack is a HyperCard tool kit that lets you precisely control a compact disc (in a CD-ROM player) to create musical stacks. The scripts are thoroughly and clearly commented, and anyone with Hyper-Talk proficiency should find them easy to modify. Requires Mac Plus or later, HyperCard or SuperCard, a hard-disk drive, a CD-ROM drive, and speakers or headphones. \$99.95. The Voyager Company, 1351 Pacific Coast Hwy., Santa Monica, CA 90401. (213) 451-1383. (Nov '90)

NUMBER CRUNCHING

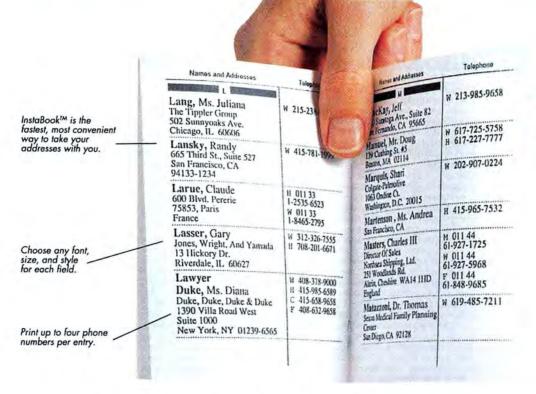
Calculator Construction Set

Calculator Construction Set lets you build almost any sort of calculator imaginable. The finished calculators are working DAs. Takes some effort and you need to read the manual, but the results are worth it. Version 2.0 reviewed. Version 2.09.6 shipping. Requires any Mac (hard-disk drive recommended). \$89.95. Dubl-Click Software, Inc., 9316 Deering Ave., Chatsworth, CA 91311. (818) 700-9525. (Feb '90)

DATA ACQUISITION & ANALYSIS

Analog Connection Workbench \$\$\$\$%

Analog Connection Workbench is an icon-based application generator for general-purpose data acquisition, control, and analysis. Users create flow diagrams that make live color plots. Powerful and easy to use. Version 3.0 reviewed. Version 3.0.5 shipping. Requires Mac SE or later. \$995.





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Strawberry Tree, Inc., 160 S. Wolfe Rd., Sunnyvale, CA 94086. (408) 736-8800. (July '89) ATLAS*MapMaker 4.5 \$\$\$\frac{1}{2}\$

ATLAS*MapMaker is a digital cartographer that displays demographic and marketing information geographically. A large library of maps and supporting data is available (some at additional cost) but no internal database manager. The program is fast at presentation mapping; provides international maps; and supports U.S. boundary maps by state, county, ZIP, ADI, and DMA. Version 4.5 reviewed. Requires Mac Plus or later. \$495. Strategic Mapping, Inc., 4030 Moorpark Ave., Ste. 250, San Jose, CA 95117. (408) 985-7400. (Mar '91)

Business Simulator \$355
Business Simulator is a simulation-game business training tool.
Make decisions that manage a company through several stages during 25 years. Decisions become tougher over time. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later and a hard-disk drive or extra floppy drive. \$69.95. Strategic Management Group, Inc. (SMG), 3624 Market St., Philadelphia, PA 19104. (800) 445-7089 or (215) 387-4000. (Dec '87)

DeltaGraph \$\$\$\$\$\$
DeltaGraph is a charting and graphics tool. Has 22types of 2-D and 3-D charts. Uses up to 256 colors per chart. Produces high-quality business graphics. Easy to use and can import data from most sources. Version 1.0 reviewed. Version 1.5 shipping. Requires Mac Plus or later, System 6.0.3 or later, and a hard-disk drive. \$195. DeltaPoint, Inc., 2 Harris Court, Ste. B-1, Monterey, CA 93940. (800) 367-4334 or (408) 648-4000. (Mar '90) * '87, '89 Eddy Descartes 1.0.3 \$

Descartes 1.0.3 is a digital cartographer that displays demographic and marketing information geographically. Has innovative, easy-to-use, iconic, internal database manager. Although it doesn't provide international maps, it includes U.S. boundary maps by state and county. Lacks support for Apple's DAL. Version 1.0.3 reviewed. Requires Mac SE or later with 2 MB of RAM. \$795. Intermap, 13 Dartmouth College Hwy., Lyme, NH 03768. (603) 795-4751. (Mar '91)

GeoQuery \$\$\$\$
GeoQuery is a digital cartographer that displays demographic and marketing information geographically. The program provides no internal database manager or international maps, but it supports U.S. boundary maps by state, county, ADI, and DMA (not by ZIP code). Excellent feature set for the price. The program's interface for Apple's DAL is helpful for networked corporate users.

Version 1.0 reviewed. Version 2.0.1 shipping. Requires Mac Plus or later and System 6.0.3 or later. \$395. GeoQuery Corp., 475 Alexis R. Shuman Blvd., Ste. 380E, Naperville, IL 60563. (800) 541-0181 or (708) 357-0535. (Mar '91)

Igor tttt Igor is a data-visualization and -analysis program. Offers reasonably complete set of options and tests. Doesn't have all the datamanipulation features of a statistics program but can define anything mathematically. Powerful macro language and easy command structure. Good performance. Printing quality and speed are excellent. Imports graphics as well as data and supports color. Version 1.1 reviewed. Version 1.2 shipping. Requires I MB of RAM available for application, System 4.1 or later, and a hard-disk drive. \$295. WaveMetrics, P.O. Box 2088, Lake Oswego, OR 97035. (503) 620-3001. (Jun '90)

IPLab Spectrum \$\$\$ IPLab Spectrum is a scientific image-processing package that extracts and analyzes data from photographic-quality color images. Supports video capture and includes scripting language. Interface is neither predictable nor intuitive. Allows mathematically expressed image modification down to the pixel level. Provides a Movie command to cycle through a series of images. No morphology and quantitative analysis. Version 1.0 reviewed. Requires color Mac II series with 4 MB of RAM. \$749. Signal Analytics Corp., 374 Maple Ave. E., Ste. 200, Vienna, VA 22180. (703) 281-3277. (July '91) Ithink \$\$\$\$%

Formerly named STELLA Software for Business, Ithink is a simulation tool for modeling complex business systems. Requires that you master a discipline called system dynamics. Version 1.02 shipping. Requires Mac Plus or later. \$450; academic discounts available. High Performance Systems, Inc., 45 Lyme Rd., Ste. 300, Hanover, NH 03755. (800) 332-1202 or (603) 643-9636. (June '88)

KaleidaGraph \$\$\$\$
KaleidaGraph is a superb dedicated graphing and analysis package. Data can be entered on a 256-column-by-32,000-row spreadsheet. Exceptionally nice printed output. Version 2.0 reviewed. Version 2.1 shipping. Requires Mac Plus or later. \$249. Synergy Software, 2457 Perkiomen Ave., Reading, PA 19606. (800) 876-8376 or (215) 779-0522. (Feb '90)

LabVIEW 2 ststs
LabVIEW 2 is a graphical programming environment for creating applications that manage data-acquisition, robotics, and machine-control operations. Data analysis includes complex math

and signal processing. It is one of the best-designed and most efficient systems on the Mac or PC for creating "virtual" instruments: Engineers accustomed to sketching block diagrams (before programming a data-acquisition task) can feel comfortable with this program, where the user's drawing becomes the actual functioning software interface. Version 2.1 reviewed. Requires 4 MB of RAM and a hard-disk drive. \$1,995; run-time version, \$495. National Instruments Corp., 6504 Bridge Point Pkwy., Austin, TX 78730. (800) 433-3488 or (512) 794-0100. (May '91) ★ '90 Eddy

MacADIOS II \$\frac{1}{2}\frac{1}{

MacInstruments \$35%
MacInstruments is an oscilloscope emulator with chart-recorder functions and some statistics capabilities. Records up to 833,000 samples per second and works with a wide selection of GW hardware. Version 1.04 reviewed. Version 1.05 shipping. Requires Mac Plus or later. \$790. GW Instruments, 35 Medford St., Somerville, MA02143. (617) 625-4096. (July '89)
MacLab \$\frac{1}{2}\$\$

The MacLab is a hardware/software package that turns your Mac into an oscilloscope with chartrecorder functions. Records from 12 samples per hour to 80,000 samples per second. Nice interface and analysis features, such as slope of tangent and area under curve. Built-inamplifiers. Version 2.5 reviewed. Version 3.0 shipping. Requires Mac Plus or later. \$3,535; optional differential amplifiers, \$1,125. World Precision Instruments, Inc., 175 Sarasota Center Blvd., Sarasota, FL 34240-9258. (813) 371-1003. (July '89) MacPacq \$\$\$

The MacPacq is a hardware/software oscilloscope and chart-recorder emulator that records from 2 samples per hour to 10,000 samples per second. The portable hardware can be used remotely. Version 1.05e reviewed. Version 1.2 shipping. Requires Mac 512Ke or later. MP10, \$1,195; MP20, \$1,395; MP100, \$2,295; optional external amplifier, \$295; optional external amplifier for MP10, \$395. BioPac Systems, Inc., 275 S. Orange Ave., Ste. E, Goleta, CA 93117. (805) 967-6615. (July '89)

MacSpin \$555 MacSpin is a powerful program for graphic data analysis. Handles multivariate data in a highly visual manner. Version 1.0 reviewed. Version 3.0 shipping. Requires Mac Plus or later. \$295. Abacus Concepts. 1984 Bonita Ave., Berkeley, CA 94704. (800) 666-7828 or (415) 540-1949. (June '86) ★ '87 Eddy

Parameter Manager Plus \$\$\$\$
Parameter Manager Plus analyzes data in real time, using a spread-sheetlike interface. Handles both hand-entered and imported data. Includes statistical quality control, equation fitting, predictive maintenance, histograms, drawing, and presentation. Version 3.0 reviewed. Requires Mac Plus or later. \$795. GenRad, Inc., 510 Cottonwood, Milpitas, CA 95035. (408) 432-1000. (July '89)

Spyglass Dicer \$\$\frac{1}{2}\frac{1}{2

Spyglass Dicer provides a 3-D, full-color, detailed perspective view of statistical data. Although its implementation is weaker than that of other data-visualization tools from Spyglass, Dicer does create useful images from huge amounts of information in HDF (Hierarchical Data Format), the public-domain format invented at the National Center for Supercomputing Applications. It comes with MPW C 3.1 and FORTRAN libraries. Dicer can import raw binary data in many formats and accepts data in the netCDF format. Version 1.0 reviewed. \$495. Spyglass, Inc., 701 Devonshire Dr., Box C-17, Champaign, IL 61820. (217) 355-1665. (Feb '91

Spyglass Transform \$\$\frac{1}{2}\frac{1}{2}\$
Spyglass Transform is a dataanalysis package that lets you
analyze huge arrays of numbers
by viewing them as pictures. Requires some knowledge of FORTRAN. Version 1.0 reviewed.
Version 2.0 shipping. Requires
Mac II or SE30 with an 8-bitvideo display, System 6.0.3 or
later, and a hard-disk drive. \$395.
Spyglass, Inc., 701 Devonshire
Dr., Box C-17, Champaign, IL
61820. (217) 355-1665. (Oct '90)

Spyglass View tttt Spyglass View is a data-analysis package that provides a variety of ways to view arrays of numbers as pictures. Can string pictures together and animate them, which lets you see how a picture changes over time, in space, or with any other independent variable. Has excellent color tools and a variety of palettes. Requires some knowledge of FORTRAN. Version 1.0 shipping. Requires Mac II or SE/30 with 8-bit-video display, System 6.0.3 or later, and a hard-disk drive. \$395. Spyglass, Inc., 701 Devonshire Dr., Box C-17, Champaign, IL 61820. (217) 355-1665. (Oct '90) SuperANOVA \$\$\$\$%

SuperANOVA is a slick linearmodeling program with a great interface. Feature-laden and powerful. Version 1.0 reviewed. Version 1.1 shipping. Requires Mac Plus and System 6.0.3 or

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Mobius dealer. Then turn your Mac into a much bigger Classic.



MiniFinders

later, \$495. Abacus Concepts, 1984 Bonita Ave., Berkeley, CA 94704. (800) 666-7828 or (415) 540-1949. (Mar '90) ★ '89 Eddy Tactician 2.0 \$\$\$\$\\\^2\)

Tactician 2.0 is a digital cartographer that displays demographic and marketing information geographically. It has an excellent interface that incorporates Apple's DAL. A large library of maps and supporting data is available, but there is no internal database manager. The program has no international maps but supports streetlevel mapping and U.S. boundary maps by state, county, ZIP, ADI, and DMA. It has excellent perfor-mance. Version 2.0 reviewed. Requires Mac II series, a color monitor, 4 MB of RAM, and a hard drive. \$995; CD-ROM, \$3,995. Tactics International, 16 Haverhill St., Andover, MA 01810. (800) 927-7666 or (508) 475-4475. (Mar '91) * '90 Eddy

Ultimage/X \$\$\$\$ Ultimage/X is a scientific imageprocessing package that extracts and analyzes data from photographic-quality color images. Supports video capture. Includes scripting language and provides morphology and sophisticated quantitative analysis. Allows mathematically expressed image modification down to pixel level. A 3-D View command plots color perspective graphs with mountains and valleys corresponding to pixel light intensity. Includes AutoMac III macro program and Developer's Toolkit for customizing the Ultimage Usermenu. Version 1.34 shipping. Requires color Mac II series with 4 MB of RAM. \$2,990. Graftek-France GTFS, Inc., 2455 Bennett Valley Rd., Ste. 100C, Santa Rosa, CA 95404. (707) 579-1733. (July '91)

MATHEMATICS

Expressionist tttt

Expressionist is a program designed to make writing mathematical applications easy. It can be installed either as a DA or as an application. Flexible and has good documentation for word-oriented applications. Version 2.03 shipping. \$129.95. Prescience, 939 Howard St., San Francisco, CA 94103. (415) 543-2252. (July '90)

MathCAD tttt

MathCAD is a solid math processor for equation solvers. Creates charts, although its data-handling ability is somewhat limited. Data entry needs to be improved and made more Mac-like. Version 2.02 reviewed. Version 2.06 shipping. Requires Mac Plus or later. \$495. MathSoft, Inc., 201 Broadway, Cambridge, MA 02139. (800) 628-4223 or (617) 577-1017. (Apr

Mathematica ####

Mathematica is a powerful tool for doing all kinds of math. Offers arbitrary-precision numerical

calculations, symbolic computation, PostScript graphics, and programmability. Version 1.03 reviewed. Version 1.2 shipping. Requires Mac Plus or later with 2 MB of free RAM for application and a hard-disk drive. \$495; Mac II version, \$795. Wolfram Research, Inc., 100 Trade Center Dr., Champaign, IL 61820. (800) 441-6284 or (217) 398-0700, (Nov '88) ★ '88 Eddy

MathType \$\$\$1/2

MathType is a mathematicalequation-writing program. Can be installed as either a DA or an application. Equations can be copied into word-processing files. Inconvenient to use with textheavy equations. Version 2.11 shipping. Requires Mac Plus or later. \$149. Design Science, 4028 Broadway, Long Beach, CA 90803. (800) 827-0685 or (213) 433-0685. (July '90)

Model-It! \$\$\$%

Model-It! is a good tool for simple mathematical modeling and simulating small dynamic systems. Good manual. Performance is adequate - input is mediocre, and output is basic, Requires prior knowledge of modeling - there's no AI. Version 1.0 reviewed. Requires Mac 512Ke or later. \$295. Norris Software Systems, 5201 Western Ave., Ste. 432, Knoxville, TN 37921. (615) 588-5774. (Jun '90)

Theorist tttt

Theorist is an elegant equation solver that's versatile, full-featured, and powerful. There are no procedures - everything is done with user-created propositions that are easy to build. Superb interface. Dozens of math functions and transformations are automatically activated by a few menu commands. Can visualize equations and theories through graphs and animation, including 3-D and color. Version 1.01 reviewed. Version 1.1 shipping. Requires Mac Plus or later, \$399.95. Prescience Corp., 939 Howard St., San Francisco, CA 94103. (415) 543-2252. (Jun '90) ★ '89 Eddy

SPREADSHEETS

DataMerge \$\$\$\$

DataMerge simplifies manipulation of tabular data. It works with all major spreadsheet programs and can merge up to nine files. The files can be larger than existing RAM. Excellent performance. Version 2.0 reviewed. Requires Mac Plus or later. \$99. Seawell MicroSystems, Inc., 3808 39th Ave. S.W., Seattle, WA 98116. (800) 347-7008 or (206) 322-3123. (May '90)
Desktop Help for Excel ttt

Desktop Help for Excel is a DA that provides context-sensitive help for Excel 2.2. More extensive and better than Excel's own Help file. Version 2.2 reviewed. Requires Mac Plus or later, \$79.95.

Help Software, 10659A Maplewood Rd., Cupertino, CA 95014. (408) 257-3815. (Mar '90)

Excel \$\$\$\$\$

Excel 3.0 is a full-featured highend spreadsheet package. Incorporates a multipurpose tool bar and major interface improvements. Has global search-and-replace and rows-into-columns transposition. Integral linking within documents or to other documents. Customizes menus and creates dialog and alert boxes. Strong statistical functions and matrix-math abilities. Enhanced graphics and charting capabilities. Powerful outlining, macro pro-gramming, and style sheets. Version 3.0 reviewed. Requires Mac Plus or later. \$495. Microsoft Corp., One Microsoft Way, Redmond, WA 98052. (800) 426-9400 or (206) 882-8080. (July '91) * 85 Eddy

Full Impact 2.0 tttt/2

Full Impact is a high-end spreadsheet program with impressive capabilities. The program can now import and export Excel files directly and provides global searchand-replace, virtual memory, and programmable buttons. It has excellent 3-D-chart graphics and text integration as well as 32-bit-color and presentation capabilities. Version 2.0 reviewed. Requires Mac Plus or later, \$295. Ashton-Tate Corp., 20101 Hamilton Ave., Torrance, CA 90502, (800) 437-4329 or (213) 329-8000. (Feb '91) * '88 Eddy

MacCalc tttt

MacCalc is a low-end spreadsheet program with good data-analysis tools. It has a streamlined user interface. Models can be annotated at each construction step. Fonts. styles, and formatting are variable from cell to cell. Excel, MultiPlan, or Lotus 1-2-3 models can be converted into MacCalc format without losing their formats or models. Lacks integral graphics capabilities. Relies on Microsoft Charts for graphics. Requires Mac 512Ke or later. \$139. Bravo Technologies, P.O. Box 10078, Berkeley, CA 94709. (415) 841-8552. (July '90) ★ '86 Eddy

Microtemp Financial Calculators ###

Microtemp Financial Calculators is a set of worksheets for Excel and Works that calculate common personal and small-business financial problems. The program includes cash flow, real estate, and rate-of-return calculators. Version 1.0 reviewed. \$79.95. Microtemp, 318 Mendocino Ave., Ste. 22, Santa Rosa, CA 95404. (707) 575-1459. (Aug '88)

PowerMacros for the Excel User tttt

PowerMacros offers all the power of macros without your having to learn how to write them. Includes a search-and-replace macro and a macro to transpose rows and columns, Improves Excel performance. Version 2.1 shipping. Requires Microsoft Excel version 1.5 or later. \$49.95. Individual Soft-ware, Inc., 125 Shoreway Rd., Ste. 3000, San Carlos, CA 94070. (800) 331-3313 or (415) 595-8855. (July '88)

Trapeze \$\$ %

Trapeze is a mathematical program offering the power of a spreadsheet program and the flexibility of a page-layout program. Supports a 68880 math coprocessor and calculates in the background under MultiFinder. Spreadsheets can be up to 1,600 pages long. Can open and link up to 32 spreadsheets. Wide variety of chart types and excellent control over graphics. Page-layout mode is difficult to learn. Nonstandard interface. Version 2.1 shipping. Requires Mac Plus or later. \$295. Deltapoint, Inc., 2 Harris Court, Ste. B-1, Monterey, CA 93940. (800) 367-4334 or (408) 648-4000. (July '90)

WingZ \$\$\$% WingZ is a sophisticated highend product with remarkable 3-D graphics. HyperScript language lets you change menus, options, and functions by editing the master script file. Requires a lot of custom macro programming to perform linking operations. Minimal recalculating technique can take longer than recalculating an entire spreadsheet. Version 1.1 shipping. Requires Mac Plus or later (2 MB of RAM recommended). \$399. Informix Software, 16011 College Blvd., Lenexa, KS 66219. (800) 438-7627 or (913) 599-7100. (July '90)

★ '89 Eddy

Works 1111/2 Microsoft Works is an easy-touse combination of word processor, mail-merge system, spreadsheet program, and telecommunications software. Works' spreadsheet component is a basic system that can perform most business analyses. Chart styles can be line, bar, stacked bar, pie, or combination; charts can update automatically when new data is entered into spreadsheets. The sorting function is merely adequate. The word-processing module within this integrated package rates only three mice but is adequate for simple office needs. Version 2.0 reviewed. Requires Mac Plus or later, \$295, Microsoft Corp., One Microsoft Way, Redmond, WA 98052. (800) 426-9400 or (206) 882-8080. (Jan '91) * '86 Eddy

STATISTICS

Data Desk \$\$\$\$

Data Desk, a business statistics package, is excellent for sophisticated analyses. Features great exploratory interactive graphics and solid data handling. Easy to use. Good documentation and

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on-line help. Lacks econometric procedures and presentationenhancement features. Importing restrictions may cause problems. Version 3.0 reviewed. Requires Mac 512Ke or later and System 4.1 or later, \$595. Odesta Corp., 4084 Commercial Ave., Northbrook, IL 60062, (800) 323-5423 or (708) 498-5615. (Apr '90)

Exstatix \$\$\$

Exstatix is a powerful, full-featured statistics program. Good graphing ability. Excellent manual. Good presentation-quality graphics and lavout-window capabilities for output. Good for beginners as well as advanced users. Limited ANOVA and multivariate procedures. Version 1.2 reviewed. Requires Mac Plus or later. \$349. Strategic Mapping, Inc., 4030 Moorpark Ave., Ste. 250, San Jose, CA 95117. (408) 985-7400. (Apr '90)

Fastat ttt Fastat is a statistics package that features a Mac interface and is easy to learn. Good at data analysis and range testing; can display results graphically and numerically. Graphing abilities aren't presentation quality and can be hard to manipulate, Version 1.0 shipping. Requires Mac Plus or later and a hard-disk drive. \$195. Systat, Inc., 1800 Sherman Ave., Evanston, IL 60201. (708) 864-5670. (Nov

JMP \$\$\$%

JMP is a business statistics package. Provides good data-management and exploratory interactivegraphics tools. Color available for graphics. Slow performance. Limited range of nonparametric and multivariate procedures. Confusing approach to specifying procedures. Version 1.0 reviewed. Requires Mac Plus or later. \$695. SAS Institute, Box 8000, 1 SAS Circle, Cary, NC 27512. (919) 677-8000. (Apr '90) Minitab \$\$\$

Minitab is a high-end statistics package with sophisticated procedures such as multivariate and ARIMA. Fast. Handles data efficiently. Limited documentation and on-line help. Has no support for color graphics. Version 6.2 shipping. Requires Mac Plus or later with a hard-disk drive. \$695. Minitab, 3081 Enterprise Dr., State College, PA 16801. (800) 448-3555 or (814) 238-3280. (Nov '90

SPSS for the Macintosh tttt SPSS for the Macintosh provides most of the procedures needed by professional statistical analysts. Has excellent on-line help, useful Command Generator, and clear documentation. Non-Mac interface. Has some graphics flaws. Text is editable. Version 4.0 shipping. Requires a hard-disk drive and at least 2 MB of RAM. \$795; Advanced Statistics, Trends, Table, and Categories modules,

\$395 each, SPSS, 444 N. Michigan Ave., Chicago, IL 60611. (312) 329-3300. (Nov '90)

StatView II tttt

StatView II is a complete dataanalysis package. Excellent for any kind of descriptive, comparative, or multivariate statistics. Works in color on suitably equipped Mac II machine. Tables and graphics must be viewed as separate output. Version 1.03 shipping. Requires Mac SE or II series with 68020 or 68030 processor and FPU, \$495. Abacus Concepts, 1984 Bonita Ave., Berkeley, CA 94704. (800) 666-7828 or (415) 540-1949. (Apr '90)

StatView SE + Graphics ttt StatView SE + Graphics is the SE version of StatView. Features easy-to-use interface and excellent presentation graphics. Full range of procedures available. Datatransformation functions are limited. Weak interactive exploratory graphics, but performance is adequate. Version 1.03 shipping. Requires Mac SE. \$350; with SuperANOVA, \$575. Abacus Concepts, 1984 Bonita Ave., Berkeley, CA 94704. (800) 666-7828 or (415) 540-1949. (Apr '90)

SYSTAT for the Macintosh

SYSTAT for the Macintosh is a statistics program with good Maclike interface. Some slow and awkward data- and variable-handling features. Good graphics, including 3-D charts and color graphics. Consumes a lot of memory. Version 5.0 reviewed. Version 5.1 shipping. Requires Mac Plus or later with 4 MB of RAM and a hard-disk drive. \$795; Design, Logit, Probit, and Testat modules, \$110 each. SYSTAT, Inc., 1800 Sherman Ave., Evanston, IL 60201. (708) 864-5670. (Nov '90)

ORGANIZATIONAL TOOLS

Acta Advantage \$\$\$\$

Acta Advantage is an outliner application. Also comes with the Acta DA. Smart Paste lets you paste material from other applications into Acta outline format. Includes drivers for translating Acta outlines into MORE and ThinkTank and into MacWrite, WriteNow, Works, and RTF files. Version 1.03 reviewed. Version 1.04 shipping. Requires Mac 512Ke or later. \$129. Symmetry Software Corp., 8603 E. Royal Palm Rd., Ste. 110, Scottsdale, AZ 85258. (800) 624-2485 or (602) 998-9106. (Aug '89) * '89

DiagramMaker tttt

DiagramMaker is a multipurpose object-linking program. Forms a network of custom-designed objects with connecting points at the centers, corners, or centers of sides. Customizes organization charts from text outlines. Lines ioin on contact and can be pulled into arcs. Objects can be linked to objects in other documents. No automatic right-angle line maintenance. Useful text-find feature. Version 1.1 reviewed, Version 2.0 shipping. Requires Mac Plus or later. \$295. Action Software, 1507 E. Franklin St., Ste. 122, Chapel Hill, NC 27514, (800) 826-0550 or (919) 544-9219, (Jan '90)

Microsoft Office CD-ROM

The Microsoft Office is Word, Excel, Mail, and PowerPoint on a CD-ROM (a disk version is also available). Includes a full set of Adobe screen fonts, a copy of DocuComp, Excel templates, lots of clip-art samples, and other Microsoft applications. A HyperCard stack controls everything. Comprehensive on-line HyperCard documentation, \$849, Microsoft Corp., One Microsoft Way. Redmond, WA 98052. (800) 426-9400 or (206) 882-8080. (Apr '90)

Org Plus for Macintosh \$\$\$\$% Org Plus creates hierarchical organization charts quickly, intuitively, and with a surprising variety of styles and formats. Nearly all the graphics drudgery required in chart making is automated by this easy-to-use program. Banner Blue publishes the best-selling DOS org-chart program. Don't assume that this Mac version is simply a PC port. Org Plus is a top-quality Mac program that can exchange files with its DOS counterpart. Version 1.0 reviewed. \$195. Banner Blue, P.O. Box 7865, Fremont, CA 94537. (415) 794-6850. (May '91)

PERSONAL INFO MANAGERS

Address Book Plus \$\$\$\$%

Address Book Plus is a nameand-address manager. It prints on one side of a page only. A limited DA allows file access from other applications. Good sorting and import/export abilities. Wide range of font and type-size options. Fast and flawless performer. Version 2.0 reviewed. Requires System 6.0.3 or later. \$99.95; upgrade, \$25. Power Up Software Corp., 2929 Campus Dr., San Maleo, CA 94403. (800) 851-2917 or (415) 345-5900. (Apr '90) Alarming Events ####

Alarming Events is a DA that provides an integrated electronic appointment book. Its interface resembles a monthly calendar, where the dates act as buttons and open up to your daily schedule; a five-day view is also available. You can set alarms to go off at specified times, and you can keep track of events that are automatically kept in an ongoing to-do list. It can provide advance warning of upcoming events, and you can designate recurring events. Ver-sion 1.0 reviewed. Version 1.03

shipping. \$129.95. CE Software, Inc., P.O. Box 65580, West Des Moines, IA 50265. (800) 523-7638 or (515) 224-1995. (Feb '91)

Business Class \$\$\$\% Business Class is a HyperCard stack that contains world-travel information and itinerary planning. Uses maps to locate countries but lacks United States do-mestic-travel information. Incompatible with HyperCard 2.0. Requires HyperCard. \$49.95. Activision (Mediagenic), 3885 Bohannon Dr., Menlo Park, CA 94025, (415) 329-0500, (Mar '88)

CalenDAr tttt

CalenDAr is a reliable, innovative DA that manages your appointments and reminders. Isn't as full-featured as competing packages but offers a unified interface and excellent control of recorded or system sounds. These sound enhancements include the ability to create repeating reminders or single alarms with your voice, which is digitized and saved with Farallon's MacRecorder driver. CalenDArisn't convenient for exporting or archiving a record of past activities. Version 1.0 reviewed. Version 1.1 shipping. \$49.95. Psybron Systems, Inc., P.O. Box 431, Charleston, WV 25322. (800) 866-4260 or (304) 340-4260. (June '91)

CalendarMaker tttt CalendarMaker is a utility that creates a variety of calendars. Excellent printing routines. Calendars can be customized with graphics and icons. Version 3.0 reviewed. Version 3.0.1 shipping. Requires Mac 512K or later and System 4.1 or later, \$49.95, CE Software, Inc., P.O. Box 65580, West Des Moines, IA 50265. (800) 523-7638or(515)224-1995.(Sept

C.A.T III \$\$\$

1991

C•A•T is a personal-information manager that tracks contacts, activities, and time. The program has documentation and user-interface problems. Features include capacity for an unlimited number of contacts for each account, 16 pages of notes for each, letter writing, drawing, simple math calculation, and even dialing the phone. Difficult to use. Version 1.0 shipping. Requires Mac Plus or later. \$495. Chang Laboratories, Inc., 3350 Scott Blvd., Bldg. 25, Santa Clara, CA 95054. (408) 727-8096. (Oct '90) City to City \$\$\$\$

City to City is a HyperCard stack that provides travel information on 31 U.S. cities, including details about hotels, restaurants, and nightlife. It can help you plan an itinerary. Incompatible with HyperCard 2.0. Version 1.0 reviewed. Requires HyperCard and a printer. \$49.95. Activision (Mediagenic), 3885 Bohannon Dr., Menlo Park, CA 94025. (415) 329-0500. (Sept

DynoDex tttt

DynoDex is an address-book program. Includes a binder and binder-sized paper for printouts. Prints on both sides of the paper. Imports data from text files, but needs a DA to access data while you're in other applications. Has HyperCard stack for preparing HyperCard address stacks. Ver-sion 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later and a PostScript or Quick-Draw printer. \$125. Portfolio Systems, Inc., 21 E. Market St., Rhinebeck, NY 12572. (914) 876-7744. (Feb '90)

Focal Point II tttt/

Focal Point II is a major upgrade of this popular organizational tool. The program contains 18 modules. an E-mail system, and the Task Manager module as well as more print options, calendar, telephone log, and client accounts. Version 1.0 reviewed. Requires Hyper-Card 1.2.2 or later and a hard-disk drive. \$199.95. TENpointO, 3885 Bohannon Dr., Menlo Park, CA 94025. (415) 329-7616. (Apr

For the Record ####

For the Record is a database program designed for legal, financial, and personal records. Allows password locking for screens containing sensitive personal data. The program is comprehensive, is easy to learn, and has smooth operation. Its database fields can be modified, and summary reports can be generated and printed. Good documentation. Version 2.0 reviewed. \$59.95. Nolo Press, 950 Parker St., Berkeley, CA 94710. (800) 992-6656 (outside CA) or (415) 549-1976. (June '91)

Front Desk MultiUser ttt%

Front Desk MultiUser is a schedule and resource manager best suited for small professional offices. Can be used in a networked multiuser environment. Basic functionality but simple and capable. Version 6.10 shipping. Requires Mac Plus or later, System 4.2 or later, and a hard-disk drive. Single user, \$99; 10-user pack, \$500. Peachtree Software, 1505 Pavilion Place, Norcross, GA 30093. (800) 247-3224 or (404) 564-5800. (Jan '90)

IdeaFisher \$\$\$\$

IdeaFisher is a thought processor that's based on an eight-disk, 7-MB database of words, phrases, clichés, and titles. Cross-referenced and indexed in several ways. Useful search techniques, Conclusions are held in separate file. Has a text-based interface, so is fairly quick but unattractive. Unsophisticated filters. Version 3.0 shipping. Requires Mac Plus or later and 7 MB of space on a harddisk drive. \$595. Fisher Idea Systems, Inc., 18881 Von Karman Ave., Irvine, CA 92715. (800) 289-4332 or (714) 474-8111. (May '90)

Intouch tttt/2

Intouch is a simple, fast DA that keeps track of names, addresses, telephone numbers, and personal notes. Provides basic search capabilities plus the ability to easily print customized labels and envelope layouts. Printing options include any typeface (in any size) that fits into your layout, including bar codes and facing identification marks; embedded graphics for any of ten return-address selections; and special messages in the lower left corner of envelopes. Provides options for auto-dialing telephone numbers via the Mac speaker or a modem. Version 1.0 reviewed, \$79.95. Advanced Software, Inc., 1095 E. Duane Ave., Ste. 103, Sunnyvale, CA 94086. (800) 346-5392 or (408) 733-0745. (Apr '91)

MacPhonebook \$\$\$%

MacPhonebook handles nameand-address lists with up to 1,600 entries. Best at printing lists in large, medium, and small (Little Black Book) formats. Good for constant data updating. Version 1.0 reviewed. Version 3.0 shipping. Requires Mac Plus or later. \$49.95. Synex, 692 Tenth St., Brooklyn, NY 11215. (800) 447-9639 or (718) 499-6293. (Oct '89)

My Time Manager 111/2

My Time Manager is a complete time-management system with a full range of nicely implemented tools. Includes an appointment and reminders book, to-do list, and daily or monthly reports. New version planned for System 7 compatibility. Performance is good, and the publisher support is excellent. Version 2.0 reviewed. Version 3.5 shipping. Requires Mac Plus or later and System 6.0.3 or later, \$79.95; free upgrades (\$15 for new manual). MacShack Enterprises, 19 Harrington Rd., Cambridge, MA 02140. (617) 876-6343. (Apr '90)

Planisoft \$\$ 1/2

Planisoft is an easy-to-use appointments manager. Can maintain multiple schedules and works well in its networked version. The program suffers from a lack of flexibility and integration. Builtin contacts database needs more options and the ability to add and customize data fields. Documentation is thin and doesn't include an index. Version 1.1 reviewed. \$349; for 5 users, \$895; for 10 users, \$1,295. ASD Software, Inc., 4650 Arrow Hwy., E-6, Montclair, CA 91763. (714) 624-2594. (Apr

QuickDex \$\$\$\$%

QuickDex keeps your telephone numbers in an electronic Rolodex DA. Dials phones easily. Version 1.4d shipping. Requires Mac Plus or later (hard-disk drive recommended). \$60. Casady & Greene, Inc., 22734 Portola Dr., Salinas, CA 93908. (800) 359-4920 or (408) 484-9228. (Jan '89)

Remember? tttt

Remember? is a shareware INIT that lets your Mac remind you of important items. At startup it presents a window with any daily notes. Easy-to-maintain free-form occasion list. Lets you check your calendar in advance. Implementation is clean. Version 1.3 reviewed. Shareware, \$10. David Warker, 1330 W. North St., Egg Harbor, NJ 08215. (July '90)

Rendezvous ***

Rendezvous is a classy personal organizer with excellent printing abilities. Useful and well-designed calendar, planner, diary, and todo-list forms. Lacks a name-andaddress section and needs automatic transfer of data between sections. Version 2.5 reviewed. Requires Mac Plus or later and System 6.0.3 or later. \$200. PMC Telesystems, Inc., P.O. Box 5748, Vancouver, British Columbia V6B 4A9, Canada. (604) 255-9949. (Feb '90)

Smart Alarms 3.0 and Appointment Diary 3.1 1111

Smart Alarms 3.0 and Appointment Diary are two bundled DAs that provide separate electronic appointment books. Smart Alarms lets you set simple, reliable reminders for events (including recurrent projects), and these reminders pop up no matter what application you're using. Appointment Diary is equivalent to a calendar, with dates that act as buttons and open up to a daily schedule. Information can be copied from Appointment Diary to Smart Alarms, but the two DAs are not linked. A networked, multiuser version of Appointment Diary is available. Version 3.0/ 3.1 reviewed. \$125; discounted multiuser licenses available. JAM Software, P.O. Box 1345, Point Reyes Station, CA 94956. (415) 663-1041, (Feb '91)

WillMaker 4.0 ttt

WillMaker is a simple, valuable program for creating wills. Not elegant but does the job reliably and well. It can present a series of straightforward questions for you to answer or full information screens that explain legal issues. Printed output is fairly plain, but text can be exported for use in a word-processing or page-layout program. The program cannot handle conditional bequests. Includes an excellent manual that covers the software, wills, estate planning, and professional advice. Version 4.0 reviewed. Requires Mac Plus or later and System 6.0 or later. \$69.95. Nolo Press, 950 Parker St., Berkeley, CA 94710. (800) 992-6656 or (415) 549-1976. (Apr '91)

PROJECT PLANNERS & ORGANIZERS

AEC Information Manager AEC Information Manager is a dedicated database program for managing project information. Designed for use with MacProject II or Micro Planner. Helps manage data needed to make decisions and monitor status. Alarm keeps track of critical dates. Version 1.21 reviewed. Version 1.22 shipping. Requires Mac Plus or later, \$695, AEC Software, 22611 Markey Ct., Bldg. 113, Sterling, VA 22170. (703) 450-1980. (Oct 198

Business Plan Toolkit tttt/2 Tim Berry's Business Plan Toolkit is an integrated set of Excel macros and templates with Hyper-Card-based text that makes creating business plans and forecasts relatively easy. Excellent manual. Version 4.0 shipping. Requires Mac 512K or later and System 4.2 or later, \$149.95. Palo Alto Software, 260 Sheridan Ave., Ste. 219, Palo Alto, CA 94306. (800) 229-7526 or (415) 325-3190. (Sept

FastTrack Schedule ####

FastTrack Schedule is a flexible Gantt-based project scheduler that uses a hierarchical outline format. Provides a high degree of functionality and excellent on-screen and printed-graphics abilities. A good project-management system for the Mac. Lacks spreadsheet and graphing tools as well as capabilities for reporting slipped start or completion dates. Version 1.5 reviewed. Requires Mac Plus or later. \$235. AEC Software,

FlowMaster is a flowcharting package that charts your ad dollars in print, TV, billboard, and other media. Analyzes costs/ benefits of a campaign in innovative terms. Includes bar-chart and tabular output as well as a color-drawing environment for touching up charts. Version 2.01 reviewed. Version 2.02 shipping. \$795. Telmar Information Services, 902 Broadway, New York, NY 10010, (212) 460-9000, (June

KeyPlan tttt

KeyPlan is an outliner/project planner. Lacks some of the powerful tools of MacProject II or Micro Planner Plus but is easier to use. Flexible, fast, and suited for managers who need quick projectplanning help. Version 1.0 reviewed. Version 1.06 shipping. Requires Mac Plus or later and System 6.0.3 or later. \$395. MacVONK USA, 313 Iona Ave., Narbeth, PA 19072. (215) 660-0606. (Apr '90) * '89 Eddy

MacFlow tttt

MacFlow is a specialized flowchart tool. Creates a variety of general business diagrams, including decision trees and projectschedule charts. Top-level chart objects work like buttons in



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Motion Works

HyperCard, revealing underlying details or even launching separate applications. Good hierarchical nesting capabilities, plus flexible control of connection or intersection of lines and symbols. Imports art for conversion to custom symbols. Version 3.5 reviewed. Requires Mac Plus or later and System 6.0.3 or later. \$295. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. (818) 991-6540. (July '91)

MacProject II ttt

MacProject II is a well-executed PERT and CPM project-management system with time and expense reporting. Can manage projects and produce management reports. Crisp documentation with an easy-to-follow design makes this package a true value. Version 2.1v3shipping. Requires Mac Plus or later. \$499. Claris Corp., 5201 Patrick Henry Dr., Santa Clara, CA 95052. (800) 544-8554 or (408) 727-8227. (Oct '89)

MacSchedule \$\$\$1/2

MacSchedule is a simple Ganttbased project-management and outliner system. Offers advanced project-time scaling but isn't for advanced Gantt users. Limited color, graphics, and printing capabilities. Useful spreadsheet and graphing tools. Interface complicated by too many hierarchical menus, which could be combined into dialog boxes. Tracks slipped start or completion dates. Version 2.5 reviewed. Requires Mac Plus or later. \$245. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301.(818)991-6540.(June '91)

MacSchedule Plus ttt MacSchedule Plus is a powerful Gantt-based project-management and outliner system for advanced Gantt users. Offers project-time scaling. Limited color, graphics, and printing capabilities. Useful spreadsheet and graphing tools. Interface complicated by too many hierarchical menus, which could be combined into dialog boxes. Tracks slipped start or completion dates. Can calculate financial information and cost schedules. Version 1.0 reviewed. Requires Mac Plus or later. \$345, Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. (818) 991-6540. (June

MetaDesign tttt/

MetaDesign is a powerful organizational tool. Graphically depicts relationships among systems. Complex, detailed program. Version 1.0 reviewed. Version 2.47 shipping. Requires Mac Plus or later. \$250. Meta Software, 150 Cambridge Park Dr., Cambridge, MA 02140. (800) 227-4106 or (617) 576-6920. (Apr '88)

Micro Planner and Project Exchange tttt/

Micro Planner and Project Exchange provide full PERT and CPM implementations with advanced resource leveling and management reporting. Output can be used easily for management presentations. Micro Planner version 6.1f and Project Exchange version 1.08 shipping. Require Mac Plus or later. Micro Planner, \$595; Project Exchange, \$100. Micro Planning International, 655 Redwood Hwy., Ste. 311, Mill Valley, CA 94941. (800) 852-7526 or (415) 389-1420. (Oct '89)

PERT & Critical Path Techniques \$\$\$%

PERT & Critical Path Techniques is a technically sophisticated project-management system. Has full Gantt and CPM implementation, including all second-order slack and timing calculations. Doesn't make good use of the Mac interface. Version 6.0 shipping. Requires Mac Plus or later. \$152. Lionheart Press, Inc., P.O. Box 379, Alburg, VT 05440. (514) 933-4918. (Oct '89)

Project Scheduler 4 111/2

This project-management software is frustratingly nonintuitive, but it has several advantages for full-time project planners (especially if they need WBS or OBS codes). A variety of time lines and reports is possible. Users familiar with the DOS version might forgive the Mac version's unfriendly interface, Version 1.0 reviewed, \$685. Scitor, 393 Vintage Park Dr., #140, Foster City, CA 94404. (415) 570-7700. (Jan '91)

ScheduleMaker \$\$\$\$

ScheduleMaker is a dedicated employee- or equipment-scheduling system that uses a simple Gantt-type chart format. Not a project-management tool. Automates the process of figuring out who should work when and how much it will cost. Version 2.0 reviewed. Version 3.01 shipping. Requires Mac Plus or later. \$395. Craig Systems, 16717 Monitor Ave., Baton Rouge, LA 70817. (504) 756-2322. (Oct '89)

TopDown \$\$\$\$

TopDown is a strong flowchart and organization-chart tool with a choice of connection modes for each individual line. Generates text-based reports, Excellent rightangle-reconnection talents, even with major object shifts. Limited user control of line-symbol connection. No line nodes for other line attachment. Excellent navigation throughout hierarchy, view to view, and page to page. Version 1.1a reviewed. Version 2.0 shipping. Requires Mac Plus or later and System 6.0.3 or later (hard-disk drive recommended). \$345. Kaetron Software Corp., 12777 Jones Rd., Ste. 445, Houston, TX 77070. (713) 890-3434. (Jan '90)



Acknowledge ####

Acknowledge is a combination

communications program and interpreted-language system. Lets advanced programmers create customized applications that accomplish many telecommunications tasks - from automatically picking up E-mail to communicating with VAXes. Version 1.0 reviewed. Requires Mac Plus or later (hard-disk drive recommended). \$199. Prometheus Products, Inc., 7225 S.W. Bonita Rd., Tigard, OR 97223. (800) 477-3473 or (503) 624-0571. (Jan '89) * '88 Eddy

Cause \$\$\$ Cause is a database-programming environment designed for nonprogrammers. Nonstandard formats. Unable to create a true Mac interface. Projects are portable between Mac and PC versions. Version 1.0 reviewed. Version 1.12 shipping. Requires Mac Plus or later with System 5.0 or later. Bundled Mac and PC versions, \$495; separate versions, \$295 each. CYMA, 1400 E. Southern, Tempe, AZ 85282. (800) 292-2962. (Feb '90)

HookUp! \$\$\$\$

HookUp! is an iconic softwareprogramming utility. It teaches the basic concepts of programming, simple animation, sound manipulation, and even a few more-sophisticated functions. Version 1.01 reviewed, \$149. Hip Software Corp., c/o VPL Research, Inc., 656 Bair Island Rd., Redwood City, CA 94063. (415) 306-1150 or (415) 361-1710. (Jan

Prograph tttt

Prograph is a completely visual programming language. Each different programming construct has a unique pictogram associated with it. Programs are constructed by connecting icons; the connecting links represent the way data flows in the program. Currently an interpreted language. Slow. Version 1.22 reviewed. Version 2.0 shipping. \$195; version 2.0, \$395. TGS Systems Ltd., 2745 Dutch Village Rd., Ste. 200, Halifax, Nova Scotia B3L 4J9, Canada. (800) 565-1978 or (902) 455-4446. (Sept '90) ★ '89 Eddy

LANGUAGES

AAIS Prolog \$\$\$\$

AAIS Prolog is a fast standard Prolog with excellent debugging and error handling. Good for serious program development. Poor documentation. Version 1.0 reviewed. Version M-2.0 shipping. Requires Mac Plus or later. \$298. Advanced AI Systems, P.O. Box 39-0360, Mountain View, CA 94039.(415)948-8658.(Mar '87)

ExperCommon LISP \$\$\$% ExperCommon LISP is a LISP development system. Not fully Common LISP-compatible. Creates good compiled code and stand-alone applications. Version 1.0 reviewed. Version 2.2 ship-

ping. Requires Mac Plus or later. \$995; for Mac II series, \$1,195. ExperTelligence, Inc., 5638 Hollister Ave., Goleta, CA93117. (805) 967-1797. (Aug '87)

ExperProlog II \$\$\$ ExperProlog II is a Prolog based on the Prolog II standard. Handles infinite trees and allows userdefined functions that operate conditionally. Has nonstandard Mac interface. Poor documentation. Version 2.4 shipping. Requires Mac Plus or later. \$495. ExperTelligence, Inc., 5638 Hollister Ave., Goleta, CA 93117. (805) 967-1797. (Mar '87)

Macintosh Allegro Common LISP tttt

Macintosh Allegro Common LISP is a development environment with an EMACS-style editor that implements most Common LISP editing and debugging functions. Version 1.2.1 reviewed. Version 1.2.2 shipping. Requires Mac Plus or later and a hard-disk drive. \$495. APDA (Apple Programmers & Developers Association), 20525 Mariani Ave., MS #33G, Cupertino, CA 95014. (800) 282-2732 or (408) 562-3910. (Nov '88) * '88 Eddy

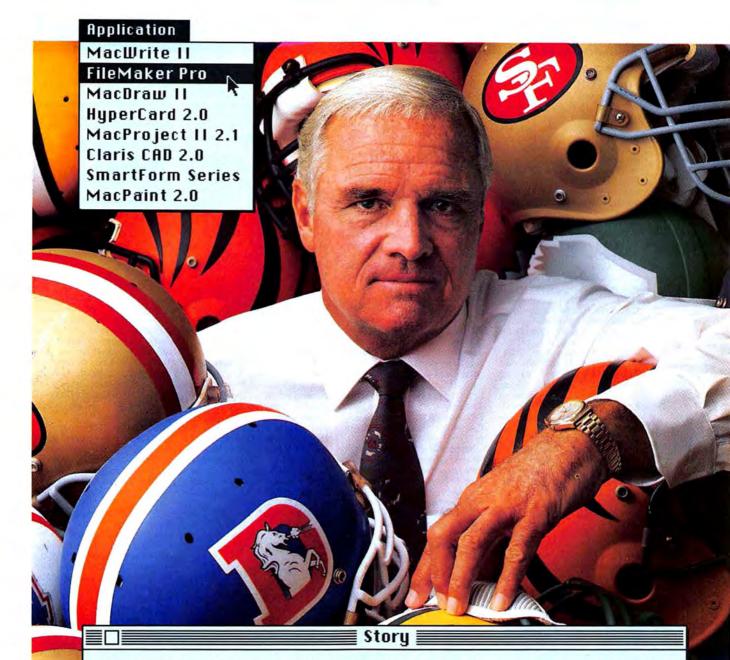
Quintus MacProlog \$\$\$\$ Quintus MacProlog is a very useful program that includes incremental and optimizing compilers, a graphics-environment package, and C and Pascal submodules. Supports color. Version 2.0 reviewed. Version 3.5 shipping. Requires Mac Plus or later, \$595. Quintus Corp., 2100 Geng Rd., Ste. 101, Palo Alto, CA 94303. (415) 813-3800. (Feb '88)

THINK C \$\$\$\$

THINK C is an object-oriented programming language. Features rapid turnaround time for development and testing of programs through use of an integrated compiler, linker, and editor. Source-level debugger steps through code line by line to examine variables' values. Version 4.0 reviewed, Requires Mac Plus or later and System 6.0.3 or later (hard-disk drive recommended). \$249. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014. (800) 441-7234 or (408) 253-9600. (Mar '90) * '88 Eddy

THINK Pascal \$555 THINK Pascal 3.0 is at the cutting edge of software development for the Mac. Has full support for OOP (object-oriented programming) and has an exemplary development environment that includes integrated source-level debugging and extraordinarily fast compileand-link times. This is the development system to use if you program in Pascal on the Mac. Version 3.0 shipping. Requires Mac Plus or later. \$249; upgrade, \$69. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014. (800) 441-7234or(408)253-9600.(Sept '90) ★ '90 Eddy

MICE RATINGS ... 1 1/2 11 11/2 111/2 111/2 111/2 11/2 11/



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MiniFinders

Tools

Anatool \$355 Anatool is a CASE package with a powerful DFD (data-flow diagramming) tool. Uses a simple palette and drag interface for building DFDs. Excellent integration of components. Good documentation and consistency checking. Version 3.1 shipping. Requires Mac Plus or later (harddisk drive recommended). \$925. Advanced Logical Software, 9903 Santa Monica Blvd., Ste. 108, Beverly Hills, CA 90212. (213) 653-5786. (Jan '90)

Convertit! ###

ConvertIt! does an excellent job of converting older, simple HyperCard stacks to a format usable by ToolBook, a Windows 3.0 (PC) hypermedia product. ConvertIt! 1.2 can handle stacks created with HyperCard versions up to 1.2.5. Has conversion problems with scripts, icons, bitmapped graphics, type fonts, sounds, XCMDs, XFCNs, and field numbers. The resulting files will be much larger in ToolBook format than when compacted in HyperCard. Version 1.2 reviewed. Requires Mac Plus or later, a 386based PC with 4 MB of RAM, and a way to perform Mac-to-PC text transfer (if the Mac has no SuperDrive to write to 3.5-inch PC disks). \$199. Heizer Software, P.O. Box 232019, Pleasant Hill, CA 94523, (800) 887-7667 or (415) 943-7667. (June '91)

Debugger V2 and MacNosy

The Debugger V2 is a run-time debugger; MacNosy is a well-established global interactive decompiler. These powerful tools are not aimed at casual users. The Debugger is great if you have two screens. A new feature is its IBS (Interactive Build System), which can save a great deal of testing time. Both parts of the package work well with all common environments, including THINK Pascal and C and all flavors of MPW (Macintosh Programmer's Workshop). The manual can be confusing. Version 2.3.2 shipping. Requires 2 MB of RAM and System 6.0.3 or later (hard-disk drive recommended), \$350. Jasik Designs, 343 Trenton Way, Menlo Park, CA 94025. (415) 322-1386. (July '90)

INIThound tttt

INIThound is a developers' tool that carefully monitors the startup process and reports exactly what transpires. A handy tool for eliminating INIT conflicts. Simplifies debugging. Version 1.0 reviewed. Version 1.1 shipping. Requires Mac Plus or later. \$129. Cambridge Information Ware, P.O. Box 1296, Cambridge, MA 02238. (617) 484-8364. (Mar '90) Instant-Expert \$\$\$%

Using Instant-Expert is an excel-lent way to learn the mechanics of

creating an expert system. The inference engine (which ultimately finds the answer) is visible. Interface is weak. Version 2.0 shipping. \$69.95. Human Intellect Systems, 3261 Ash St., Palo Alto, CA 94306. (415) 571-5939. (Jan '88)

Just Enough Pascal 1111

Just Enough Pascal is a Pascal tutorial. It has an excellent manual and 20 well-planned lessons. Good for learning how to program Macs. Version 1.0 reviewed. Requires Mac Plus or later, System 6.0.3 or later, and THINK Pascal 2.0 or later (hard-disk drive recommended). \$75. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014. (800) 441-7234 or (408) 253-9600. (Sept '89)

Lasertalk \$\$\$\$\$

Lasertalk is a PostScript programming tool that establishes interactive contact with laser printers. Its Preview window and on-line help make it a powerful aid. Copy-protected until registered. Version 1.0 reviewed. Requires Mac Plus or later and a PostScript printer. \$249. Adobe Systems, 1585 Charleston Rd., P.O. Box 7900, Mountain View, CA 94039. (800) 344-8335 or (415) 961-4400. (May '88)

Nexpert Object \$555

Nexpert Object is a powerful Cbased expert-system shell for the Mac. The system is rule- and object-based, with an excellent editing interface. The inference engine chains backward and forward, and inheritance is bidirectional between classes and objects. Knowledge bases can be ported to other platforms without rewriting. Not copy-protected, but installation is limited to one per package. No Cut and Copy commands. Version 1.1 reviewed, Version 2.0 shipping. Requires Mac Plus or later and System 6.0.3 or later (hard-disk drive and color monitor recommended). \$5,000. Neuron Data, Inc., 156 University Ave., Palo Alto, CA 94301. (800) 876-4900or(415)321-4488.(Sept

PostShow ttt/

PostShow is an interactive set of modules that lets programmers see the effects of PostScript code. Operation is straightforward. Not too fast but adequate. Supports the most-common PostScript commands. Version 1.0 reviewed. Version 1.1 shipping. Requires Mac Plus or later with 2 MB of RAM for use under MultiFinder (hard-disk drive recommended). \$224.95; PostShow Professional (22 extra fonts), \$294.90. Lincoln & Co., 29 Domino Dr., Concord, MA 01742. (800) 223-7469 or (508) 369-1441. (Apr '90)

Preditor 111

Preditor is a programming editor that performs rectangular editing it manipulates blocks of text that aren't a full page wide. Marred by indifferent performance, an odd interface, and a weak manual. Version 1.0.1 reviewed. Version 1.1 shipping. Requires Mac Plus or later. \$90. Evatec, P.O. Box 219093, Portland, OR 97225. (503) 297-6175. (Mar '90)

Prototyper \$\$\$\$

Prototyper is an applicationspecification program. Lets you create a program interface and simulate how an application would work. Comes with source-code generators for THINK C 3.0, MPW C 2.0 and 3.0, Turbo Pascal, THINK Pascal, MPW Pascal, and TML Pascal II. A useful tool for quick and easy application mock-ups. Version 2.0 reviewed. Version 3.0 shipping. Requires Mac Plus or later and System 4.1 or later. \$299. SmethersBarnes, 520 S.W. Harrison, Ste. 4345, Portland, OR 97201. (800) 237-3611. (Aug '89) V.I.P. (Visual Interactive

Programming) \$\$\$\$

V.I.P. is a unique visual-programming system for creating Mac applications. Programs are constructed in a flowchart-type manner. Easy access to most Toolbox routines. Translators are available for THINK C, THINK Pascal, Turbo Pascal, MPW C, and MPW Pascal, Extensions are available for Grid Manager, Speech Manager, Matrix Manager, Advanced Manager 1, and Telecommunications Manager. Version 2.0 reviewed. Version 2.5.1 shipping. Requires Mac Plus or later, \$149.95. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301.(818)991-6540.(June '87)



SYSTEMS

A/UX 2.0 ttt%

Apple's implementation of UNIX for the Mac offers the best features of the Mac interface and operating system along with full UNIX functionality. We found only a few minor bugs, which are being fixed by aggressive maintenance upgrades. A/UX is now getting full tech support from Apple. Version 2.0 reviewed. Version 2.0.1 shipping. Requires Mac with 68030 CPU (or 68020 and PMMU), 4 MB RAM, and 80-MB hard-disk drive (IIfx with 20 MB RAM and largest hard drive you can afford recommended). CD-ROM, \$795; floppy disk, \$995. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Jan '91)



UTILITIES

AFE (Apple File Exchange)

AFE (Apple File Exchange) is one of the utilities that come free with the Mac System Tools disks. AFE has a simple interface and works with a wide variety of datatransfer methods. Its best feature is that it works with the current MacLinkPlus/Translators. By itself, its translators are limited to MacWrite generic text. Free. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Oct '89)

After Dark \$\$\$\$%

After Dark is the excellent screen saver that introduced the concept of modules. Interesting modules, including Puzzle, have been released. Version 2.0 shipping. Requires Mac 512Ke or later; sound requires System 6.0.3 or later. \$39.95. Berkeley Systems, Inc., 1700 Shattuck Ave., Berkeley, CA 94709. (415) 540-5535. (Apr '90)

AutoSave II \$\$\$

AutoSave II provides insurance against system crashes. It saves your work automatically at intervals from 1 to 99 minutes. Compatible with many applications but not recommended for use with databases. Version 1.01 reviewed. Version 2.0 shipping. \$49.95. Magic Software, Inc., 2239 Franklin St., Bellevue, NE 68005. (800) 342-6243 or (402) 291-0670. (Dec '89)

ClickChange \$\$\$\$% ClickChange is a control panel that lets you customize your Macintosh's interface by modifying various features such as window borders, title bars, text, menu background, sounds, and dialog boxes. Comes with a library of more than 40 cursors and 30 excellent sounds. Extremely easy to use. Version 1.0.3 reviewed. Version 1.0.4 shipping. Mac Plus or later and System 6.0.3 or later. \$79.95. Dubl-Click Software, Inc., 9316 Deering Ave., Chatsworth, CA91311. (818) 700-

9525. (Mar '91) Comment ####

Comment is an electronic version of Post-it notes. This mini word processor lets you attach notes to a spreadsheet cell, to words in a text document, or to a window on the desktop. Version 2.0 reviewed. Version 2.03 shipping. Requires Mac Plus or later and System 5 or later. \$99.95. Deneba Software, 3305 N.W. 74th Ave., Miami, FL 33122. (800) 622-6827 or (305) 594-6965. (Dec '88)

Desk \$\$\$%

Desk is a collection of seven powerful DAs: DeskPaint, Desk-Draw, DeskWrite, DeskSecretary (appointment calendar), Desk-Com (modem control), DeskCalc, and DeskFile (minidatabase). Although not on a par with Microsoft Works, Desk lets you access its DAs from within any application. Version 1.0 reviewed. Version 3.03 shipping. Requires Mac Plus or later; DeskPaint requires a color display system, 2 MB of RAM, and a hard-disk drive. \$399.95. Zedcor, 4500 E. Speedway, #22, Tucson, AZ

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Please circle 358 on reader service card.

85712. (602) 881-8101. (Jan '91) DiskTools Plus tttt

DiskTools Plus is a set of eight useful DAs and applications. The DiskTools II DA is a Finder replacement. Also includes an RPN calculator, Phone Pad, and Calendar Manager. Version 1.0 reviewed. Requires Mac Plus or later, \$49.95. Electronic Arts. 1820 Gateway Dr., San Mateo, CA 94404, (800) 245-4525 or (415) 571-7171, (Mar '88) HandOff II \$\$\$\$\$

HandOff II lets you launch documents from applications that are not the ones the documents were created with. HandOff II works with a variety of document types (including graphics) and lets you simply double-click on documents created with earlier program versions. Its ability to remember pixel depth (colors or grays) and volume settings for different programs is also useful. Version 1.1 reviewed. \$79.95. Connectix Corp., 125 Constitution Dr., Menlo Park, CA 94025. (800) 950-5880 or (415) 324-0727. (Feb '91)

Icon-It! \$\$\$\$%

Icon-It! lets you create icons to use as alternatives to menu commands. You can use its 100 icon templates or create your own, Version 2.0 reviewed. Version 2.1 shipping. Requires Mac Plus or later. \$89. Tactic Software Corp., 11925 S.W. 128th St., Miami, FL 33186. (800) 344-4818 or (305) 378-4110. (Feb '88) MacLinkPlus/Translators

\$\$\$\$\%

MacLinkPlus/Translators is a filetranslation package that exchanges a wide variety of text, database, spreadsheet, and graphics files between Macs and PCs. Includes DOS Mounter 2.0 software from Dayna, which allows PC disks to appear on the Mac desktop. Translation of text-formatting elements such as headers, footers, and even footnotes is generally faithfully rendered, Good graphics conversion between PC formats such as PCX, TIFF, and Windows BMP as well as Mac equivalents. Easy to use, Provides more than 350 translator pairs. Version 5.0 reviewed. Requires SuperDrive or other PC-disk drive, Apple File Exchange, and a harddisk drive. \$169. DataViz, Inc., 35 Corporate Dr., Trumbull, CT 06611.(203)268-0030.(July '91)

Mail Rater 1111 Mail Rater is a large HyperCard stack that determines postage rates. Erasable data stacks. Includes HyperCard, Version 1.1 reviewed, Version 3.0 shipping. Requires Mac Plus or later and HyperCard 1.2.2 or later. \$29.95. Tight Line Software, 27601 Forbes Rd., Ste. 50, Laguna Niguel, CA 92677. (714) 367-0007. (Feb '90)

Maxima tttt

Maxima breaks the 8-MB limit on

your Mac SE/30 or Mac II. Lets your applications use up to 14 MB of virtual hard-disk memory. Can also create a lightning-fast RAM disk. Elegant design is flawless. No RAM-disk automatic writethrough or volume-size-partitioning features. Version 1.0.5 shipping. Requires SE/30 or Mac II and a hard-disk drive. \$129. Connectix, 125 Constitution Dr., Menlo Park, CA 94025, (800) 950-5880 or (415) 324-0727. (Sept

MicroRX SE1 \$\$\$ MicroRX SE1 is a HyperCard stack that diagnoses your SE's problems. The details are meant for qualified service techs, but anyone using it can gain better knowledge of what's inside the SE. Well done and easy to use. Version 1.01 shipping. Requires HyperCard 1.2.1 or later. \$99. MicroMat Computer Systems, 7075 Redwood Blvd., Novato, CA 94947, (800) 829-6227 or (415) 898-6227. (July '90)

MockPackage Plus Utilities tttt

MockPackage Plus Utilities is a set of extremely powerful DAs. Includes a text editor, text printer (supports LaserWriter), charter, terminal, EZmenus, and several other useful tools. Version 4.4 shipping. Requires Mac Plus or later. \$49.95. CE Software, Inc., P.O. Box 65580, West Des Moines, IA 50265. (800) 523-7638 or (515) 224-1995. (Mar 87) Norton Utilities for the

Macintosh tttt/

The Norton Utilities package provides complete tools for protecting and restoring the data on your hard-disk drive. Utilities that optimize hard-drive performance and speed up searches for missing files are included, as is an application that modifies the appearance of Finder windows. Another useful software component is the Key-Finder DA, which simultaneously displays all available keyboard characters. This utilities package is highly recommended. Version 1.0 reviewed. Mac Plus or later. \$129. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014. (800) 441-7234 or (408) 253-9600. (Apr '91) ★ '90 Eddy

Now Utilities \$\$\$\$%

Now Utilities is an inexpensive collection of tools: StartUp Manager INIT (controls INITs, control panels, and Chooser documents). Super Boomerang INIT (adds navigation features to Open and Save dialog boxes), Profiler (hardware/software analysis), Now Menus, WYSIWYG Menus, FinderKeys, MultiMaster (desktop and menu-bar management), DeskPicture (custom desktop background), Customizer (alters windows, folders, and the like), Alarm Clock, Previewer (previews printed documents), and ScreenLocker (a crash-prone,

moderately secure password system that's with other INITs). Version 2.0 reviewed. \$129. Now Software, Inc., 520 S.W. Harrison, Ste. 435, Portland, OR 97201. (800) 237-3611 or (503) 274-2800. (Apr '91)

Partner tttt

Partner is an INIT that lets you edit embedded graphics while using DTP or word-processing programs. Can put graphics files into applications that don't usu-ally accept them. Version 1.0 reviewed. Requires Mac Plus or later with at least 2 MB of RAM, System 6.0.3 or later, and MultiFinder. \$99. Salient Software, 124 University Ave., #103, Palo Alto, CA 94301.(415)852-9567.(May '90)

Personality 111

Personality is a control panel that lets you change the look and feel of your Mac's interface. You can modify scroll bars, menus and their backgrounds, window borders, title bars, text, and so on, Extremely easy to use, Personality is unique, because it can change the menu font and create 3-D menus. Provides only eight cursors and doesn't include any sounds. Version 1.0.1 reviewed. Requires Mac Plus or later and System 6.0.2 or later. \$59.95. Baseline Publishing, 1770 Moriah Woods Blvd., Ste. 14, Memphis, TN 38117. (800) 926-9676 or (901) 682-9676. (Mar '91)

POWERmenus \$\$\$\$\$

POWERmenus is two products in one. The first allows full access to menus from anywhere on-screen. The second, Gadgets, includes a phone dialer, notepad, and useful launchers for DAs, control panels, and applications. Version 1.03 reviewed. Requires System 5.0 or later. \$79.95. Magic Software, Inc., 2239 Franklin St., Bellevue, NE 68005, (800) 342-6243 or (402) 291-0670. (Jan '90)

Pyro! tttt

Pyro! is a screen saver with 12 user-selectable entertaining modules. Good use of color. Handles background tasks well. Can automatically switch to simpler modules when the background load is heavy. Version 4.0 shipping. Requires Mac Plus or later. \$39.95. Fifth Generation Systems, 10049 N. Reiger Rd., Baton Rouge, LA 70809. (800) 873-4384 or (504) 291-7221. (July '90)

Quickeys 2 tttt

QuicKeys lets you make full use of your Apple extended keyboard. Assign any command (menu choices, DAs, and the like) or series of text blocks and/or commands to any key or key combination. Enormously powerful. This new version has added the capability to run macros that trigger sequences of tasks, but QuicKeys 2 still can't handle conditional macros. Some applications, INITs, or control panels may have incompatibility problems. Version 2.0.1 reviewed. Version 2.1 shipping. \$149.95. CE Software, Inc., P.O. Box 65580, West Des Moines, IA 50265. (800) 523-7638 or (515) 224-1995. (May '91) * '87 Eddy

Screen Gems \$\$\$\$

Screen Gems is a package of five color utilities for the Mac II. Color Desk puts art onto your desktop, Dimmer dims the screen when the Mac is inactive, and Switch-a-Roo lets you switch between any two color modes instantly. Globe is a neat demo, and TN-3 lets you customize the Finder's Color menu. Version 1.0 reviewed. Requires Mac II series with 2 MB of RAM, System 4.2 or later, and a color monitor. \$79. Microseeds Publishing, Inc., 5801 Benjamin Ctr. Dr., Ste. 103, Tampa, FL 33634.(813)882-8635.(Sept '89)

Stepping Out II tttt Stepping Out II is a software alternative to a large-screen monitor. Lets you create a virtual screen (as large as memory allows) inside the Macintosh's 9-inch screen. Automatically scrolls to new document position as you type or draw. Version 2.0 reviewed. Version 2.02 shipping. Requires Mac Plus or later. \$95. Berkeley Systems, Inc., 1700 Shattuck Ave., Berkeley, CA 94709. (415) 540-5535. (Oct '88)

SUM II (Symantec Utilities for

Macintosh) 111/2

SUM II is an upgraded, expanded version of the excellent SUM datarecovery package. Includes utilities for partitioning, encrypting, backing up, defragmenting, and optimizing floppies and hard-disk drives. Straightforward and reliable for defragmenting and optimizing. Requires Mac Plus or later and System 6.0.3 or later. \$149.95. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014. (800) 441-7234 or (408) 253-9600. (Apr '91) * '88 Eddy

SuperGlue II ttttt SuperGlue II, an excellent printto-disk program, offers superior operation along with many nice touches, such as Glue Notes (Postit-like notes) and One-Timer, an Fkey that makes operation immensely easier. Version 2.01 shipping. Requires Mac Plus or later and System 6.0.3 or later. \$119.95. Solutions, Inc., P.O. Box 783, Williston, VT 05495. (802)

865-9220. (Nov '89) Tempo II Plus **ttt**

Tempo II Plus is a powerful macro program designed for owners of extended keyboards. Especially good for building sequential macros. Unique features include conditional branching and the ability to remember menu selections by name. Tempo II Plus' use of several separate files is potentially confusing, but the bundled installer application helps a lot. This package has many incompatibilities with common (and

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Microtek Scan

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Input resolution: 150 dpi

Size: 403K

None

Output Resolution: 200 dpi

Line Screen: 150 lpi Gamma Correction:





Silverscanner
Original:
8 x 10 B&W print
Brightness level:
default
Input resolution:
150 dpi
Size: 419K
Output Resolution:
200 dpi
Line Screen: 150 lpi

Microtek Scan

Original: 8 x 10 color print

Brightness level: default

Input resolution: 150 dpi

Size: 1201K

Output Resolution: 200 dpi

Line Screen: 150 lpi

Color Correction: None





Silverscanner

Gamma Correction:

None

Original: 8 x 10 color print

Brightness level:

Input resolution: 150 dpi

Size: 1220K

Output Resolution:

200 dpi

Line Screen: 150 lpi

Color Correction:

hen it comes to selecting the right scanner, be forewarned. There is a difference you can see in black and white. And color. Just look at this comparison between the La Cie Silverscanner and the Microtek 300ZS. Both images were scanned at default settings with no corrections. This entire ad was then created and separated using Adobe Photoshop, Quark XPress 3.0 and a Linotronic 330.

As you can see, Silverscanner produced a better-looking image than the Microtek scan. Silverscanner lets you scan color,

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often necessary) applications, control panels, and INITs - and even some System software. Version 1.2.4 reviewed. \$169.95. Affinity Microsystems Ltd., 1050 Walnut St., #425, Boulder, CO 80302. (800) 367-6771 or (303) 442-4840. (May '91)

Tidy It Up! tttt/2

Tidy It Up! organizes the System Folder and straightens its contents visually. Attractive, intuitive interface. Customizable categories, including color-coding capabilities. Also available for download on Zmac and other on-line services. Version 1.0 reviewed. Shareware fee, \$15. Guy Fiems, 77 av., Leopold III, 1970 Wezembeek-Oppem, Belgium. (May '90)

Virtual 2.0 \$\$\$\$\$

Virtual is a virtual-memory program. Provides up to 15 MB of effective RAM. Excellent performance and superb support. Version 2.0 reviewed. Version 2.0.3 shipping. Requires Mac Plus or SE (with accelerator card), II (with optional 68851 PMMU), SE/30, or later. \$199; with PMMU chip, \$275. Connectix Corp., 125 Constitution Dr., Menlo Park, CA 94025. (800) 950-5880 or (415) 324-0727. (Apr '90) * '89 Eddy

WorksPlus Command tttt WorksPlus Command lets you build and define macros for all Works modules. Predefined macros provide for tight integration of the program's word-processing, spreadsheet, and database modules. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later and Works. \$149.95. Lundeen & Associates, P.O. Box 30038, Oakland, CA 94604. (800) 233-6851 or (415) 893-7587. (May '88)

BACKUP & FILE RECOVERY

911 Utilities \$\$\\\

911 Utilities undeletes files without first copying and moving the deleted files and has a good troubleshooting guide. Of the available file-recovery utilities, it has the worst file-recovery performance and poor performance in panic situations. Difficult interface. The popular Virex virusprotection program is included. Version 1.0 shipping. Requires Mac Plus or later. \$149.95. Microcom, Inc., P.O. Box 51489, Durham, NC 27717. (919) 490-1277. (Apr '91)

AutoBack 1111

AutoBack creates copies of nonbacked-up data files on another hard-disk drive (or on selected tape drives) whenever you save or activate a file. Doesn't back up applications and System files. Can be set up to back up only selected files, although these options are limited. Performance is very good. Version 1.70 shipping. \$99. TerraNetics, 1538 N. Martel Ave., Ste. 413, Los Angeles, CA 90046.

(213) 882-6013 or (415) 962-8652. (Aug '90)

Backmatic tttt

Backmatic is an INIT that scans your hard disk whenever you shut down and backs up all the changed files. Can back up to floppies, a folder on your hard disk, or a server. Wide-ranging, easy-to-use exclusion abilities. Slow but utterly reliable. Version 2.0 shipping. Requires Mac Plus or later and System 4.2 or later, \$99.95; 5user pack, \$295; 10-user pack; \$495. Magic Software, Inc., 2239 Franklin St., Bellevue, NE 68005. (800) 342-6243 or (402) 291-0670. (July '90)

Cat-Back ttt%

Cat-Back combines disk cataloging and backup. Good cataloger, but backing up from one partition to another on the same drive crashed the program. Other performance was OK. Can perform incremental and mirror-image backups. The interface and overall operational procedure could use some work. Version 1.0 reviewed. Version 1.1 shipping. Requires Mac 512Ke or later. \$39.95. Master Manufacturing, Inc., 118 N. Cypress St., La Habra, CA 90631. (213) 694-6861. (Aug

Complete Undelete tttt

Complete Undelete is a superb file-recovery program. Excellent interface and very fast. Recovers all deleted files and fragments of partially overwritten files. Version 1.1 shipping. Requires Mac Plus or later and System 4.2 or later. \$79.95. Microcom, Inc., P.O. Box 51489, Durham, NC 27717. (919) 490-1277. (Jan '90)

Disk First Aid 111

Apple's reliable Disk First Aid is a simple diagnostic tool for floppies and hard-disk drives. It has limited file-recovery abilities compared with blockbuster utility packages such as Norton Utilities for the Macintosh, but you can't complain about its price. Free with every Macintosh. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Apr

Fastback II ttt

Fastback II is a backup utility that supports incremental and differential backups and offers a choice of compression levels. Backup configurations can be saved as preference files. Macro language supports automated procedures. Nonstandard dialog boxes are unclear. Version 2.0 reviewed. Version 2.10 shipping. Requires Mac 512Ke or later and System 4.2 or later. \$189; upgrades, \$30. Fifth Generation Systems, 10049 N. Reiger Rd., Baton Rouge, LA 70809. (800) 873-4384 or (504) 291-7221. (Oct '89)

HFS Backup ttt

HFS Backup is a top-class backup program. Quick and reliable. Includes everything from a virus checker to partial imaging capabilities. Can't back up removablecartridge drives. Version 3.0 reviewed. Version 3.5 shipping. Requires Mac 512Ke or later. \$99.95. PCPC (Personal Computer Peripherals Corp.), 4710 Eisenhower Blvd., Bldg. A4, Tampa, FL 33634. (800) 622-2888 or (813) 884-3092. (Oct '89)

Redux \$\$\$\$\%

Redux is an excellent incremental-backup program. Lets you back up files, folders, or entire volumes. You can write scripts, using BackTalk, the Redux control language. Comes with Redux Restore, a restore utility that can be distributed freely. Version 1.5 reviewed. Version 1.62 shipping. Requires Mac Plus or later. \$99. Microseeds Publishing, Inc., 5801 Benjamin Ctr. Dr., Ste. 103, Tampa, FL 33634. (813) 882-8635. (July '89)

Retrospect 1111/2

Retrospect is a full-featured backup and archival package. Supports storage devices from floppies to DAT drives. Retains AppleShare access privileges. Includes archiving capabilities. Version 1.1 reviewed. Version 1.3 shipping. Requires Mac Plus and System 6.0.3 or later, \$249. Dantz Development Corp., 1400 Shattuck Ave., Ste. 1, Berkeley, CA 94709. (415) 849-0293. (Dec '89) '89 Eddy

Shadow \$\$\$%

Shadow is a DA that automatically backs up selected files at specified time intervals and after specified actions. Doesn't work with all programs (Excel 2.2 in particular). Version 1.23 reviewed. Version 1.24 shipping. Requires Mac 512Ke or later and System 6.0.3 or later. \$49,95. Natural Intelligence, Inc., 86 Richdale Ave., Cambridge, MA 02140. (800) 999-4649 or (617) 266-7858. (May '90)

FILE & DISK MANAGEMENT

CanOpener tttt

CanOpener is a search-andretrieval utility: It searches files for specified strings. Reads and displays text, MacPaint, PICT, EPS, TIFF, RIFF, and MacDraw II formats. Odd-looking interface but easy to master. Version 1.0 reviewed. Version 1.1 shipping. Requires Mac Plus or later. \$125; free upgrades. Abbott Systems, 62 Mountain Rd., Pleasantville, NY 10570. (800) 552-9157 or (914) 747-4171. (Feb '90) * '89 Eddy

Compactor 1111

Compactor is a shareware application that creates the smallest possible compressed files, and it does so quickly. It can also create self-extracting archives that open automatically when you doubleclick on their icons, even when the Compactor application isn't available. The self-extracting feature adds only 14K to an archive. Compactor unstuffs StuffIt files up to version 1.5.1. Many of the compressed files available on online services have been created with Compactor. Version 1.21 reviewed. Shareware, \$25. Bill Goodman, 109 Davis Ave., Brookline, MA 02146. Written inquiries only. (Apr '91) * '90

Copy II Mac tttt

Copy II Mac is a collection of powerful yet easy-to-use disk utilities, including disk-copying, file-editing, and searching capabilities. Version 7.2 reviewed. Requires Mac 512Ke or later. \$39.95. Central Point Software, Inc., 15220 N.W. Greenbrier Pkwy., #200, Beaverton, OR 97006. (800) 888-8199 or (503) 690-8090. (Mar '89) * '85 Eddy

Diamond ttt

Diamond is an application that quickly compresses or decompresses files saved as archives. It is much less widely used than StuffIt or Compactor, so you won't find many Diamond-created archives available on electronic bulletin boards or on-line services. The interface is simple and straightforward, and Diamond can create self-extracting compressed archives (adding about 35K to the compressed file in the process). Version 5.3 reviewed, \$75. Sextant Corp., 1501 Laurel St., Sarasota, FL 34236. (813) 954-5622. (Apr '91)

DIRectory tttt/ DIRectory is a fast, excellent filecataloging tool. Easy-to-use Finder-like interface. It produces good printed reports. Includes actual icons and version numbers and a DA that can find files both on your disks and in DIRectory catalogs. Version 4.0 shipping. \$94. Seagull Engineering, Box 909, S-220 09, Lund, Sweden. 011-46-46-12-54-64. (Sept '90)

Disk Ranger 1111 Disk Ranger is primarily a filecataloging program. It has superb filtering abilities, plenty of useful sorting options, and good reportprinting capability, and it works quickly. Comes with a DA that reads catalog files created by the program; also searches effectively for files. Disk Ranger prints decent labels, on ImageWriters only. Can also defragment files of a userspecified size. Disk optimization is adequate. Version 1.0 reviewed. Version 4.6.3 shipping. Requires Mac 512Ke or later. \$59.95. Graham Software Co., 8609 Ingalls Cir., Arvada, CO 80003. (303) 422-0757. (July '90)

DiskDoubler tttt DiskDoubler consists of an INIT and an application for file compression and expansion. The INIT provides a simple interface, adding a pull-down menu to the Finder Install your Large Hard Drive with a Click of Your Mouse.



Installation of virtually any SCSI drive is easy and only minutes away with Ontrack's Disk Manager -Mac Hard Disk Installation Utility for Macintosh.

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Some people believe there only two types of accounting packages. Those that are really meant for use in a home, and those so complex you want to be placed into one.

In between these we proudly place MultiLedger, the accounting package for people who want something complete and well-thought out, but who may not have the letters 'CPA' stenciled on their hat.

Always operate with the proper tools. For starters, MultiLedger was designed with all four major functions included (G/L, A/R, A/P, and Inventory). Multiple module programs sometimes require multiple antacids.

Simplicity should never be confused with simplistic. Being logical and straightforward should be natural for all accounting packages. Not so. It doesn't take genius to arrange menu choices logically, just common sense. As MacWorld said, "MultiLedger has some of the simplest and most logical menus and entry screens of all of the programs I examined, and you'll never need to know the difference between a debit and a credit unless you want to." Simple, by design. Call us now at (800) 444-9922 and we'll be happy to send you a demo disk.





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and all your applications. You rarely need to access the application directly. Quick and efficient for compression. Can't decompress individual files. Other utilities such as StuffIt or Compactor are better for archiving applications. Version 3.0.1 reviewed. Requires Mac Plus or later and System 6.0.3 or later. \$79. Salient Software, 124 University Ave., #103, Palo Alto, CA 94301. (415) 852-9567. (Apr '91) DiskExpress II \$\$\$\$\$

DiskExpress II is much quicker and better than DiskExpress. One of the best hard-disk optimizers (or defragmenters) available, it can run automatically in the background, at a preset time, or manually. It's capable of several levels of optimization. When used judiciously, it does a perfect job. Version 2.04 shipping, Requires System 6.0.3 or later. \$89.95. ALSoft, Inc., P.O. Box 927, Spring, TX 77383. (713) 353-4090. (July '90)

DiskTop \$\$\$\$\$

DiskTop is the quintessential Finder-replacement DA. It's easy to use and powerful and has an excellent interface. Launches applications and performs batch copies and moves. The Find function's multiple options are unmatched, and it's very fast. Version 4.0 reviewed. Version 4.01 shipping. Requires Mac 512Ke or later, \$99.95. CE Software, Inc., P.O. Box 65580, West Des Moines, IA 50265. (800) 523-7638 or (515) 224-1995. (Jun '90)

FetchIT \$\$\$\$% FetchIT is an INIT that puts a popup menu on the right side of the small-icon and disk-name dialog boxes. This menu can be used to navigate your mounted drives or do other Finder-type operations. Performance is good. Excellent search capabilities. Version 2.01 reviewed. Version 2.2 shipping. Requires Mac Plus or later and System 6.0.3 or later, \$25, CRAZ Software, P.O. Box 6379, Haverhill, MA 01831. (508) 521-5262. (Jun '90)

File Director \$\$\$\$\$

File Director is an extremely easyto-use, versatile, and powerful collection of utilities. It includes Disk Tools (for file management and searching), File Director (an application launcher formerly called PowerStation), Calendar (a basic monthly appointment and phone-number manager that attaches notes to entries), Phone Pad (a combination notepad and phone dialer), and RPN Calculator and Scientific Calculator (two sophisticated improvements on Apple's Calculator DA). This package is a winner, especially if your hard-disk drives contain many files and applications. Requires Mac Plus or later. \$129. Fifth Generation Systems, 10049 N. Reiger Rd., Baton Rouge, LA

70809. (800) 873-4384 or (504) 291-7221. (Apr '91)

Findswell tttt

Findswell is an indispensable utility that installs a new button in the Open dialog box of every Mac application. Click on the button. type a search string, and click on Find, and Findswell searches for any files that match. Version 2.01 shipping, Requires Mac 512Ke or later. \$59.95. Working Software, Inc., P.O. Box 1844, Santa Cruz, CA 95061. (408) 423-5696. (Nov

INITPicker is a control panel that offers a scrollable list of INITs in the System so you can determine their loading order. Holding down a predetermined key combination at startup automatically shuts off all INITs and bypasses the INITPicker screen. Can be invoked at startup. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later. \$69. Microseeds Publishing, Inc., 5801 Benjamin Ctr. Dr., Ste. 103, Tampa, FL 33634. (813) 882-8635. (Aug '89) KiwiFinder Extender \$\$\$\$\$

KiwiFinder Extender lets you manage, sort, and search through large numbers of files, using a simple application called Manager. The application maintains a database about all the files on your hard-disk drive. KiwiFinder adds buttons to the Mac's standard Open and Save dialog boxes, providing many of the options available with the Manager application. For users with reasonably organized hard drives, this package isn't necessary, but it can aid those who need help with largescale file management. Version 1.0.2 reviewed. \$99. Kiwi Software, 6546 Pardall Rd., Santa Barbara, CA 93117. (800) 321-5494 or (805) 685-4031. (Apr '91)

MacTools Deluxe ttt/2 MacTools Deluxe contains utilities that include a disk optimizer. a backup program, security options, partitioning software, search/launch capabilities, and a code-manipulation program called FileEdit. MacTools Deluxe has mediocre file-recovery performance - unless it is preinstalled as a preventive system, in which case it has good panic performance and recovers deleted or erased files well. \$129. Central Point Software, Inc., 15220 N.W. Greenbrier Pkwy., #200, Beaverton, OR 97006. (800) 888-8199 or (503) 690-8090. (Apr '91)

MultiDisk ttt

MultiDisk is an excellent software disk partitioner that allows partitions to be dynamically resized, password-protected, and even encrypted. Can't erase partitions from the Finder. Version 1.11 reviewed. Version 1.2 shipping. Requires System 6.0.3 or later. \$89.95. ALSoft, Inc., P.O. Box 927, Spring, TX 77383. (713) 353-4090. (May '89)

On Cue tttt/2

On Cue lets you switch applica-tions without returning to the Finder, Under MultiFinder, active applications are listed on a pop-up menu. Can also launch directly to a specific document. Version 1.0 reviewed, Version 1.3 shipping. Requires Mac Plus or later. \$59.95. ICOM Simulations, Inc., 648 S. Wheeling Rd., Wheeling, IL 60090. (708) 520-4440. (Sept '88)

On Location tttt

On Location finds files and text strings. Once they're found, you can view file contents (for most common document formats); open a file in its native application; or copy, delete, rename, or move a file. Its main asset is blazing speed. Nonstandard interface. Expensive, but has a one-year, money-back guarantee. Version 1.0 reviewed. Version 1.0.2 shipping, Requires Mac Plus or later, System 6.0.3 or later, and a hard-disk drive. \$129.95. ON Technology, Inc., One Cambridge Center, Cambridge, MA 02142. (617) 225-2545. (Aug '90)

PickTure \$\$\$\$%

PickTure is an INIT/control panel that serves as a visual file selector. Presents rows of miniature screen shots of all files a selected application can open. Double-clicking on the screen shots opens the desired file. Radio buttons customize navigation through folders. Version 1.0 reviewed. Requires Mac Plus or later and System 6.0.3 or later, \$89.95. Right Answers, Box 3699, Torrance, CA 90510. (213) 325-1311. (July '91)

POWERicons 1111

POWERicons creates duplicate application icons for simple and efficient hard-disk-drive organization. POWERicons can open sets of frequently used icons and print document batches. Easy and fast setup. Good manual. Version 2.0 shipping. Requires System 4.2 or later. \$79.95. Magic Software, Inc., 2239 Franklin St., Bellevue, NE 68005. (800) 342-6243 or (402) 291-0670. (Feb '90)

Silverlining \$\$\$\$%

Silverlining is an advanced harddisk-utility set. Excellent diskpartitioning software available. Formats most hard-disk drives. Powerful, safe optimizing and testing features. Excellent performance, Includes DS Backup (backup software) and a good disk duplicator, Version 5.27 shipping. Requires Mac Plus or later and hard-disk drive. \$99,95. La Cie Ltd., 19552 S.W. 90th Ct., Tualatin, OR 97062. (800) 999-0143 or (503) 691-0771. (Jan '90)

Stufflt Classic \$\$\$\$\$ StuffIt Classic compresses files to reduce the amount of space they occupy on-disk. Great for transferring documents via modem.

Also joins and encrypts files. Version 1.5 reviewed. Version 1.6 shipping. Requires Mac Plus or later and System 6.0.3 or later. Shareware fee, \$25. Aladdin Systems. Inc., Deer Park Center, Ste. 23A-171, Aptos, CA 95003. (408) 685-9175. (Dec '88) Stuffit Deluxe \$\$\$\$\$

StuffIt Deluxe is the first commercial version of StuffIt, a filecompression and -archiving utility, but it's bigger and better stuffs and unstuffs files quicker and easier. Now includes security features, optional compression speeds, and a control-panel file for quick access. Version 1.0.1 reviewed. Requires Mac Plus or later and System 6.0.3 or later. \$99.95. Aladdin Systems, Deer Park Center, Ste. 23A-171, Aptos. CA 95003, (408) 685-9175, (Dec

Super Boomerang tttt

Super Boomerang is a handy INIT that adds full navigational and search features to all Open and Save dialog boxes. It automatically remembers all the files and folders recently accessed. Can be configured to always show certain files and folders. Big time saver. Version 2.0 shipping. Requires Mac Plus or later. With Now Utilities, \$129; free upgrade from Boomerang. Now Software, Inc., 520 S.W. Harrison, Ste. 435, Portland, OR 97201. (800) 237-3611 or (503) 274-2800. (Apr '90)

PRINTING

BulkMailer+ ###

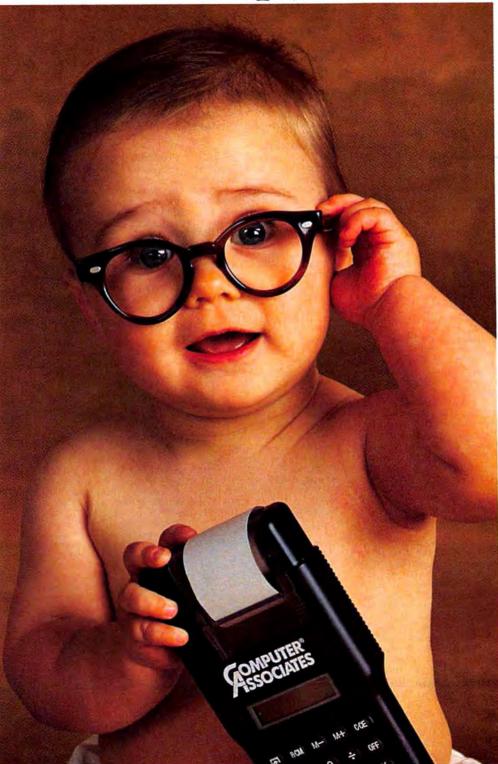
BulkMailer+ is a basic mail manager with many powerful sorting features. Port setup can be difficult. Can handle up to 90,000 names and addresses. Skips records. Version 3.23 reviewed. Version 3.25 shipping. Requires Mac Plus or later. \$350. Satori Software, 2815 Second Ave., Ste. 295, Seattle, WA 98121. (206) 443-0765. (Oct '89)

FastEnvelope \$\$1/2

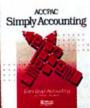
This envelope-printing DA has powerful features and flexibility, but its bugs and quirkiness diminish utility. Features include unlimited number of records, full font control, graphics capability, postal-bar-code creation, data export/import, and print merge. You can customize envelope sizes or use ten predefined standard formats. Version 1.03 reviewed. Version 2.0 shipping, \$10. Verti-cal Solutions, P.O. Box 1150, Beaverton, OR 97075. (800) 222-6032 or (503) 671-0790. (Apr '91)

FastLabel tttt FastLabel is a good label creator and printer. Excellent tools for designing labels and can include graphics and icons. Prints envelopes by treating them as large labels. Weak list handling. Version 2.0 reviewed. Version 3.0 shipping. \$79.95. Vertical Solu-tions, P.O. Box 1150, Beaverton,

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Please circle 115 on reader service card.

OR 97075, (800) 222-6032 or (503) 671-0790, (Oct '90)

Grappler Spooler ttt

Grappler Spooler is an adequate spooler but no speed demon. Installation is simple and there are few problems, but sometimes using it is slower than not using a spooler. Version 1.0 shipping. Requires Mac Plus or later, System 6.0.3 or later, and laser printer with 1 MB of RAM (hard-disk drive recommended).\$79. Orange Micro, Inc., 1400 N. Lakeview Ave., Anaheim, CA 92807. (714) 779-2772. (Apr '90)

JetLink Express ###

Bundled with a serial cable, JetLink Express is a printer driver that lets you print to non-PostScript HP printers. Provides a set of four special outline fonts that it uses automatically when you choose the standard Adobe fonts. Terrible manual, Check application compatibility before buying. Performance with HP printers is good but sacrifices many features offered by a properly configured PostScript printer. Version 2.0 shipping. Requires Mac Plus or later, System 6.0.2 or later, hard-disk drive, and HPcompatible printer. \$159. GDT Softworks, Inc., 4664 Lougheed Hwy., Ste. 188, Burnaby, British Columbia V5C 6B7, Canada. (800) 663-6222 or (604) 291-9121. (Jan '90)

KiwiEnvelopes! 3.1 tttt

This DA has simple features for one-shot envelope printing, but it needs font flexibility. Features include unlimited number of records, graphics capability, and postal-bar-code creation. Envelope sizes are limited. Has on-line help. Version 3.1 reviewed. \$49.95. Kiwi Software, 6546 Pardall Rd., Santa Barbara, CA 93117. (800) 321-5494 or (805) 685-4031. (Apr '91)

MacEnvelope 5.0 tttt%

This combination DA/application has many powerful features for envelope printing and mail management, but it lacks font flexibility and unlimited-record capability. Features include graphics capability, postal-bar-code creation, data import/export, and print merge. You can customize envelope sizes, or you can use 11 predefined standard formats as well as 150 label templates. Sorts by name or ZIP code. A Plus version of this package adds many features but costs more. Version 5.0 reviewed. Requires Mac Plus or later. \$89.95. Synex, 692 Tenth St., Brooklyn, NY 11215. (800) 447-9639 or (718) 499-6293. (Apr

MacPrint \$\$\$

MacPrint is a printer driver that lets you print to non-PostScript HP printers. Provides screen fonts for every HP font cartridge and special Compugraphic screen fonts. Includes cable. Good

manual. Check application compatibility before buying. Version 1.23 shipping. Requires Mac Plus or later, System 6.0.2 or later, a hard-disk drive, and an HP-compatible printer, \$149. Insight Development Corp., 2200 Powell St., Ste. 500, Emeryville, CA 94608. (415) 652-4115. (Jan '90)

MergeWrite ttt

MergeWrite is a mail-merge program for MacWrite. It also works with ASCII files. Combines names and addresses from a data file into predefined fields in a form letter. Allows simple conditional IF/ THEN/ELSE statements. Version 1.1 shipping. Requires Mac Plus or later. \$49.95. Software Discoveries, Inc., 137 Krawski Dr., South Windsor, CT 06074. (203) 644-9225. (Dec '87)

myDiskLabeler tttt

myDiskLabeler is an excellent label maker. Can read directories and use large or small icons. Comes with 54 precut labels. Version 1.1 reviewed. Version 3.0 shipping. Requires Mac Plus or later. \$80. Williams & Macias, Inc., S. 3707 Godfrey Blvd., Spokane, WA 99204. (800) 752-4400 or (509) 458-6312. (Aug '87)

PrintBar tttt

PrintBar calculates and prints bar codes at varying resolutions. It supports UPC, EAN, Interleaved, 2 of 5, and Code 39. Operation is a bit clunky, but performance is fine. Output is easily transferable. Easy to use. Version 2.0 reviewed. Version 3.0 shipping, Requires Mac Plus or later. Nine volumes (for different codes), \$95 to \$295 each. Bear Rock Technologies, 6069 Enterprise Dr., Diamond Springs, CA 95619. (916) 622-4640. (Jun '90)

QuickEnvelope 1.0 ttt

This DA has limited features and flexibility for envelope printing, with 1.000-record capacity. Features include full font control and print merge. You can customize envelope size or use two predefined standard formats. Without features such as graphicsimporting and postal-bar-code capability, QuickEnvelope can't compete with similar envelopeprinting utilities. Version 1.0 reviewed. \$49. GCC Technologies, Inc., 580 Winter St., Waltham, MA 02154, (800) 422-7777 or (617) 890-0880. (Apr '91)

SharpenUp tttt/

SharpenUp is an INIT/control panel that automatically adjusts the relative width of lines, the texture of gray patterns, and the overall brightness on your laser printer. Has no effect on text or bit-mapped or EPS graphics. Can greatly improve the quality of lines in tables in Word 4.0 or of cell outlines in Excel. Comes with a nice set of predefined styles, and users can create custom styles easily. Version 1.0 shipping. Requires Mac Plus or later. \$99.

Somak Software, 535 Encinitas Blvd., Ste. 113, Encinitas, CA 92024, (800) 842-5020 or (619) 942-2556. (Sept '90)

SuperLaserSpool ####

SuperLaserSpool supports a wide range of printers, including the HP Desk Writer. Generally excellent performance. Installation is a snap, and use is mostly transparent. Version 2.0 reviewed. Version 2.1 shipping. Requires Mac Plus or later and System 4.1 or later. \$149.95. Fifth Generation Systems, 10049 N. Reiger Rd., Baton Rouge, LA 70809. (800) 873-4384 or (504) 291-7221. (Apr '90)

SuperSpool ###

SuperSpool is a simple serial ImageWriter print spooler. It's often slightly quicker than SuperLaserSpool. No PostScript support. Version 5.0 reviewed. Requires Mac Plus or later, System 4.1 or later, and a QuickDraw printer, \$99.95. Fifth Generation Systems, 10049 N. Reiger Rd., Baton Rouge, LA 70809. (800) 873-4384 or (504) 291-7221. (Apr

TurboSpool \$\$%

This spooler has a nice interface but forces you to load spooled files into the queue manually. Sometimes printing delay is unnecessarily long. Compatible with LaserWriter and MultiFinder. \$69. PLI (Peripheral Land, Inc.), 47421 Bayside Pkwy., Fremont, CA 94538. (800) 288-8754 or (415) 657-2211. (Apr '90) UltraScript for the Macintosh

UltraScript provides softwareonly PostScript emulation that lets Mac applications get the maximum quality possible from non-PostScript printers. A serious disadvantage is that Adobe Type 1 fonts must be converted into a proprietary format in order to work with UltraScript. Adobe Type Manager still works, but it doubles the hard-drive space used by fonts. Batch processing is not possible, and not all printers and film recorders are supported. Version 1.11 reviewed. Requires Mac Plus or later and at least 3 MB of RAM (hard drive recommended), \$195; UltraScript Plus, \$445 (includes network spooler and 43 fonts). QMS, Inc., One Magnum Pass, Mobile, AL 36618. (800) 523-2696 or (205) 633-4300. (Feb '91)

SECURITY

A.M.E. (Access Managed Environment) \$\$%

This industrial-strength security system offers some of the most complete features available for the Mac, but its unforgiving approach makes it suitable only for knowledgeable users. System administrators will appreciate the Activities Log feature, which remembers any activity done on the protected Mac. You can assign access levels for users, and password protection is sophisticated. DES encryption is available. A.M.E. is effective, but it is so sensitive to user error that the program can irretrievably lose data. Version 1.1.3 reviewed. Requires Mac Plus or later, System 6.0.2 or later, and a hard-disk drive. \$279; discounted site licenses available. Casady & Greene, Inc., 22734 Portola Dr., Salinas, CA 93908. (800) 359-4920 or (408) 484-9228. (May '91)

Advanced Security \$55

Advanced Security consists of three applications: File Security, which can automatically protect your work: HD Security, which locks hard disks so they can be opened only by a special floppy; and Virus Security, which checks itself for changes when it's run. Version 1.2.2 shipping. Requires Mac Plus or later. Single-user version, \$69.95; multiuser versions available. Advanced Gravis Computer Technology Ltd., 7400 MacPherson, #111, Burnaby, British Columbia, V5J 5B6, Canada. (604) 434-7274. (May

DiskLock \$\$\$\$

The easy-to-use security program DiskLock keeps the contents of your hard drive private. The important improvements in this version include the ability to do background processing, protec-tion against the trashing of locked files and folders, and support for the U.S. Data Encryption Standard (a faster proprietary encryption is also provided). It doesn't offer customizable user levels, administrative functions, or a hierarchy of privileges. Like all security software, DiskLock works best for people who never forget their password. Version 2.0 reviewed. Requires Mac Plus or later and System 4.1 or later. \$189. Fifth Generation Systems, 10049 N. Reiger Rd., Baton Rouge, LA 70809. (800) 873-4384 or (504) 291-7221. (Mar '91)

FileGuard \$4444

FileGuard is an excellent security package that operates primarily in the background. It is unique in that it can protect folders, applications, and data files, which it accomplishes by using an easily updated list of persons who have different levels of access. There is no DES encryption (a U.S. government standard), but its proprietary encryption is well done. FileGuard provides support for the optional MaccessCard magnetic-identity-card reader, which operates as part of the ADB circuitry. Version 2.5 reviewed. Version 2.5.2 shipping. Requires Mac Plus or later; SE or later to use MaccessCard reader. \$249; 5user office pack, \$595; 10-user office pack, \$995. ASD Software, Inc., 4650 Arrow Hwy., E-6, Montclair, CA 91763. (714) 624-2594. (Apr '91)

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Our helpful sales and technical staff is standing by to answer any questions and take the mystery out out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs - (2 @ \$59 ea.).



To upgrade a 4-socket Mac Plus or SE to this amount of memory.	Do this: (Install in multiples of two only)
2 MB	Remove all four existing 256K SIMMs, install two 1 MB SIMMs, leave two sockets for future expansion.
2-1/2 MB	Remove only two 256K SIMMs, install two 1 MB SIMMs.
4 MB	Replace all four 256K SIMMs with four 1 MB SIMMs.
To upgrade an 8-socket Mac II, IIx, IIcx, oe SE 30 to this amount of memory.	Do this: (Install in multiples of four only.)
4 MB	Remove all four existing 256K SIMMs, install four 1 MB SIMMs, leave remaining sockets for future expansion.
5 MB Keep existing 256K SIMMs, install for 1 MB in remaining sockets.	
8 MB Remove all four 256K SIMMs, install eight 1 MB SIMMs.	

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Memory chips come factory-installed on plug-in cards, called SIMMS (Single Inline Memory Modules). Each one megabyte SIMMS card holds eight top quality, memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung. We also carry the full line of Dove memory products.

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If, for any reason, you are dissatisfied with your MacWAREHOUSE Memory Kit, you may return it for a full refund within thirty days of purchase. All you have to do is call us for a return authorization number and return this product, postage paid, in its original condition, with the original packaging and documentation.

ONE YEAR WARRANTY. MacWarehouse also guarantees its Memory Kits against manufacturer defects for one year from the date of purchase. We will repair the item or replace it at our discretion.

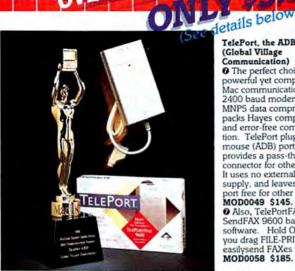


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• Also, TelePortFAX includes SendFAX 9600 baud modem software. Hold OPTION as you drag FILE-PRINT to easilysend FAXes worldwide. MOD0058 \$185.

Microsoft Excel 3.0 (Microsoft) Perform goal seek analysis, automatically link and consolidate worksheets, and produce stunning output in seconds with Excel 3.0, the most powerful analytical tool for the Macintosh. Achieve highperformance spreadsheet capabilities along with charting, database, and custom development tools created for the novice and power user alike. Features unparalleled power, advanced analytical and charting tools, and easy database access all in an ideal development environment. BUS0167. \$309.



System 7 Compatibility: @ indicates that the product will run under System 7.

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	ACCESSORIES	
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	LaserWriter II	105
	eeds, Inc.	
ACC0356	Dust Cover - Mac II & Extended Keybox	
	(grey nylon)	17.
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ACC0347	HardTops Mac Extended Keyboard Cov	
ACC0346	HardTops Mac Standard Keyboard Cox	
ACC0466	MacIlcx/ci Monitor Stand	
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	Navy	79.
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ACC0528	Ultimate Classic Carrying Case - Navy	68.
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	Anti-Glare Filter	
ACC0097	System Saver Mac - Platinum	63
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MacPro Plus (Key Tronic) • Key Tronic's new MacPro Plus keyboard is compatible with all Macintosh computers. The enhanced 105-key layout includes Period/Comma lock capability, an interchangeable Caps Lock and Ctrl keys.

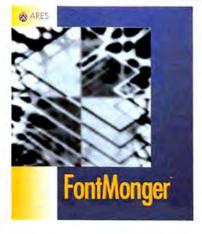
Also, the connecting cable you need is offered at no extra charge. The keyboard is backed by a limited lifetime warranty and backed by a limited lifetime warranty and unlimited toll-free product support. Includes offer for Tempo II, a keyboard macro package from Affinity Microsystems a \$149.95 value FREE! INPO156 \$145.

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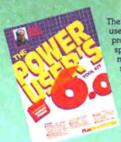
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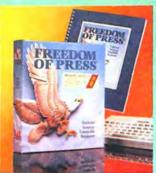


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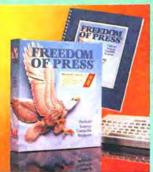


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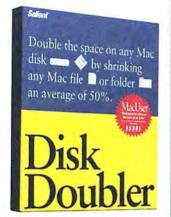
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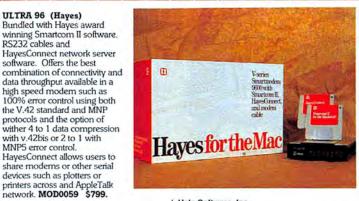
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	INSTRUCTIONA	L
Beacon	Technology, Inc.	
	4 HyperBible International Versio	n 2.0 125
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Broderb	und	
GRA0268	Kid Pix	29
EDU0170	The Playroom	29
Davidso	n & Associates	
EDU0037	Math Blaster	29.
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Help Sof	tware, Inc.	
EDU0108	Desktop Help for Excel	52
Learning	Company	
	Math Rabbit	
EDU0048	Reader Rabbit	35.
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@EDU0190	Number Munchers	29.
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MicroMa		
GRA0229	MapArt PICT Format	95.
GRA0228	MapArt EPS Formal	95.
Nordic S	oftware	
EDU0142	MacKids Preschool Pack	36.
Penton (Overseas (Full line available))
	VocabuLearn Level I or II: French, G	erman,
	Hebrew, Italian, Japanese, Russian o	ıf
	Spanish	. ea. 35.
Persona	I Training Systems	
	Macintosh, HyperCard, FileMaker Pr	0.
	Microsoft Excel, Microsoft Word, Ale	fus
	PageMaker 4.0, Aldus FreeHand, Ald	dus
	Persuasion, Quark XPress 3.0	. ea. 52.
Queue		
EDU0109	Computer SAT Prep	57.
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	Getting Started Video: Excel 2.2, Pac	eMaker
	4.0. Word 4.0	
	Advanced Techniques Video: Excel 2	
	PageMaker 4.0. Word 4.0	
	Pagerviaker 4.0. Word 4.0	ed. 55.

Timeslips III 2.0 (Timeslips Corp.) A complete time keeping and billing package for people whose stock in trade is their time. You gather time data with the TS Timer DA. When the time comes to send the bill, TS Report will extract the data and generate invoices and reports in a wide variety of formats. And Timeslips can handle the big jobs: 250 users, different activities, and over 3,000 clients, with up to 128 projects per client. **BUS0043** \$195.

TAL—Timeslips Accounting Links

© Extends Timeslips III with or without general ledger accounting software.
Generates customized income reports; links the billing and payment data from Timeslis III to accounting programs. FIN0129 \$55.



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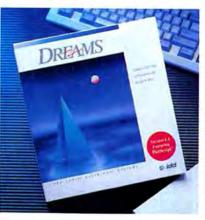


Accountant Inc. 2.0 (Softsync/BLOC) Accountant Inc. now system 7.0 compatible! O Offers a fully integrated accounting and financial management program designed with the small business user in mind. Includes General Ledger, Accounts Payable, Receivable, Payroll, and Inventory. The new version adds user-requested features including the ability to use any font and size. It supports unlimited checking accounts, sets budgets for individual months or fiscal periods. Sort payables and receivables by name, account number, or dollar amount. FIN0030 \$179.

Zondervan Publishing House	
●BOK0021 MacBible - King James Version	
●BOK0020 MacBible - New International Vi	ersion79

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Broderbi		-
ENT0259	Shufflepuck Cafe	25
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	Ferrari Grand Prix 1.6	31
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	P51 Mustang 2 8	
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	Black lack Stratomy Toctor	-
	(w/ BlackJack Ace)	65
ENT0277	Casino Master	
	Casino Master Deluxe Mac II Version	45
ENT0257	CrapsMaster	
ENT0383	Puzzle Master	20
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ENT0321	Earl Weaver Baseball	32
ENT0355		
ENT0382	PGA Tour	
	Software, Inc.	03
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ENT0347	Wizardry II: Knight of Diamonds	
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ENT0274	MacGolf Classic	52
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	Systems, Inc.	
O F ON 026	4 Adobe Type Manager 2.0	59
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	Smart Art I, II, III or IV	
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UTI0224	EPS Exchange	89
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F0N0284	Metamorphosis 2.0	89
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F0N0361	FontMonger	65
Broderb		
GRA0156	TypeStyler	119
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Bright Star Tech, Inc. 2GRA0161 interFACE 2 Claris 2GAD0029 ClarisCAD 2.0 6	99
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GRA0075 Canvas 2.1 1	
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Dream Maker	
GRA0105 Cliptures Vol 1 Business Images	
OGRA0124 Cliptures Vol 2 Business Images	
• GRA0219 Cliptures Vol 3 Sports	
• GRA0101 MacGallery (Hypercard version)	
• GRA0102 MacGallery (MacPaint version)	27.



TASTE/UltraPaint Bundle (DeltaPoint)

Get the hottest creative team of the summer! The TASTE/UltraPaint bundle includes: TASTE, the latest in word processing and page layout technology from DeltaPoint; UltraPaint, the leading paint program for color and black and white from Deneba Software; The Font Company's Glamour Medium and Philly Sport Script fonts; and a collections of EPS clip art from Dream Maker Spoftware's Cliptures series. It's the ultimate in hot summer deals at a very cool price! WRD0048 \$79.

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INP0153	Pacific MacPage	529
Postcra	ft	
DTP0062	Effects Specialist	115
QMS		
UTI0169	UltraScript	135
Sonnet		
F0N0140	FontCard NTX	
Tactic S	oftware	
F0N0265	ArtFonts	49
TeleTyp	esetting	
F0N0343	T-Script	92.
F0N0357	T-Script Basic	55.

GRAPHICS & MULTIMEDIA

3G Graph	nics				
OGRA0188	Images	with	Impact!	Accents & Bords. 1	. 65
O GRA0111	Images	with	Impact!	Business 1	_65
O GRA0257					95

Dreams 1.1 (Innovative Data)
A powerful precision drawing tool for scaled drawings, illustrations, presentations and general purpose graphics. Includes an array of drawing tools and advanced illustration features like parallel line tool, extend lines to intersection, glue and unglue, trim tool, fillet tool, true associative dimensioning and optional keyboard editing. GRA0104 \$419.

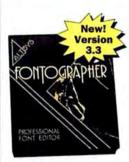
Dreams Business Graphics Library Professionally drawn vector images provide high quality PostScript printing. Images can be re-sized, edited and/or colored, such as the image shown, then copied and pasted into drawing, word processing or page

layout programs.
Free with purchase of Dreams.

Electron	nic Arts	
GRA0106	Studio/8	219
GRA0231	Studio/32	369

Enterprise (Total Systems)
Your Mac LC can add and subtract. It can even multiply and divide. But when it comes to complex spreadsheets or large graphics files, you get "impuse power" at best. Install an Enterprise 030 and you'll be running math-intensive applications at warp speed! The Enterprise 030 adds the 68882 floating point unit you need for math-based applications like Excel, and upgrades into a serious 68030

accelerator. Just plug in additional chips from the Enterprise Performance Pack, and discover a whole new world of power and speed! See line listings for prices.



Fontographer 3.3 Creates, opens, and edits downloadable PostScript fonts in Type 1, Type 3, and Truetype formats. The fonts can contain standard alphanumeric characters, foreign characters or pictograms, icons, and logos. FON0014 \$269.

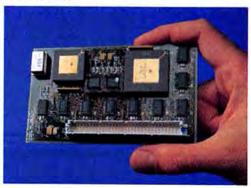


Lightning Scan 400

The fastest, most powerful hand-held scanner. Scans any flat surface instantly. Includes ThunderWorks software for fullpage scanning and a DA for scanning in any program. Rated tops by Macworld, MacUser, Publish, and Personal Publishing. INP0116 \$385.



Read My Lips Attach sounds to documents you create using popular word processors, desktop publishing, and presentation software. Use pre-recorded sounds or record your own. Both the built-in microphones of the new Macs as well as MacRecorder are supported. UTI0211 \$75.







ProModem Ultima

Only 14,400 bps modem with Fax! Supports the new V.32bis standard for 14,400 transmis-sions plus V.42bis/MNP-5 compression and error correction. Also, a 9600 bps Send/ Receive Fax with feature-filled Maxfax softwar. Includes MAcKNOWLEDGE software and cable. MOD0064 \$699.



NewsletterMaker Vol.1

Metro ImageBase Electronic Clip Art

Communicate more effectively with fabulous art and graphics from the world's largest pub-lisher of clip art. Each of the 18 ImageBase packages contains at least 100 topic-related images drawn by professional artists. GRA0169 \$85.



Offline 2.0

The complete disk manage-The complete disk management system isn't just for floppies anymore! Catalogs hard drives, Syquest cartridges, even CD ROMs. Quick and flexible search engine lets you find any file on any disk, even if it's not mounted. Prints disk labels and exports to other applications. UTI0207 \$65.

	TM Computing	246
	MediaTracks TM	219
	MediaTracks™Multimedia Pack	369
Graphso		
OCAD002	4 Blueprint	219
OCAD003	0 MiniCAD+ 3.0	595
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CAD0039	MacDraft 2.1	279
GRA0104	Dreams 1.1	419
Letraset		
OGRAD15	1 ColorStudio	599
DTP0019	ImageStudio 1.5	139
MacroM	ind	
GRA0140	MacroMind Director 2.0	629
O Metro	Image Base (Full line availa	ble)
	Newsletter Maker	ES.

Photoshop 2.0

(Adobe Systems)
Get direct access to an even wider selection of color editing and production capabilities. View and edit high-resolution CMYK color scans directly on screen scans directly on screen without changing the RGB of the monitor. Photoshop the all-in-one professional prepress, color correction, paint, video editing and darkroom system allows one seamless creation in 24-bit color or black and white. New key features include a Bezier selection tool and duotone images. GRA0191

Paracon	nn	
GRA0235		435
GRA0233		435
GRA0234	SwivelArt	
Praxitel		
UTI0211	Read My Lips	75
Silicon	Beach	
GRA0092	Digital Darkroom 2 0	259
GRA0131	Super 3D 2 1	
HYP0027	SuperCard 1.5	199.
GRA0112	SuperPaint 2.0	135
Solution		
	SmartScrap & The Clipper 2 01	56
Strata		2.74
GRA0176	StrataVision 3D 2.0	349
Strategi	c Mapping, Inc.	
GRA0227		369
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GRA0253	PixelPaint 2.1	
	9 PixelPaint Professional 2.0	519
Tactic		
GRA0110	ArtClips 1st Edition	49
GRA0160	ArtClips 2nd Edition	65
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GRA0039	ClickArt Business Image	
GRA0088	ClickArt EPS Illustrations	82.
GRA0272	ClickArt Color	.99
Zedcor		
O GRA019	9 DeskPaint 3.3	113

HARDWARE &

PERIPHERALS			
Caere INP0143 CoStar	Typist	479.	
INP0091	LabelWriter	185	

Complete Undelete (Microcom)

A quick, reliable, convenient method for recovering TRASHed files, even after the trash has been emptied. Maintains a "delete-log" of files thrown in the trash for instant review. **UTI0140 \$49**.

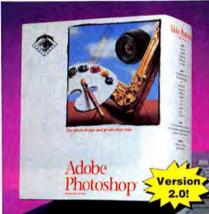
Virex 3.0

The first comprehensive solution to the threat of computer viruses. Prevents, detects and repairs files infected by all known Macintosh viruses. UTI0093 \$59.

 Problem recovery package which incorporates an extensive troubleshooting reference guide and a collection of powerful utility programs that allow you to recover data from damaged disks or files. UTI0191 \$89.

Epson EPL-7500 Laser Printer	2599
Epson EPL-7000 Laser Printer	999
Epson PostScript Kit	1599.
3	
Seikosha SP 2000 AP Printer	235
Wizard OZ 7000 (32KRam)	229
Wizard OZ 7200 (64KRam)	255
Ware	
LightningScan 400	385
ThunderScan Plus	199
	Epson EPL-7000 Laser Printer Epson PostScript Kit Seikosha SP 2000 AP Printer Wizard OZ 7000 (32KRam) Wizard OZ 7200 (64KRam) Ware LightningScan 400

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Abaton		
OINP0157	Stan 300/Color	1899
INP0164	LaserScript Printer LX	1759



Applied	Engineering	
INP0148	Quadralink	209
Articula	te Systems	
INP0160	Voice Navigator II	. 559
CH Prod	lucts	
INP0121	FollerMouse ADB	75
Curtis		
INP0141	MVP Mouse	89
Datades	k International	
INP0174	Mac101E Keyboard	129
Digital V	rision, Inc.	
GRA0145		199
GRA0154	Computer Eyes For Mac-Color	349
ICD		
INP0095	Graflex	82
Kensing	ton	
NP0059	Turbo Mouse	109
INP0060	Turbo Mouse ADB (SE or II)	109
Key Tro	nic	
@INP0156	MacPro Plus	145

Meeting Maker (ON Technology, Inc.)

A Macintosh network application that helps you plan, schedule and confirm meetings. You can schedule a time and date, select required guests, reserve rooms and resources and prepare agendas. Meeting Maker also has a personal calendar that allows you to block out activities, meetings anows you to block out activities, meetings, private work sessions, even recurring weekly or monthly appointments in a single step. You can also print your calendar in popular day-planner formats. 5-User BUS0165 \$299.; 10-User BUS0166 \$559.

ClickArt Color (T/Maker)

ClickArt Color Graphics for Presentations is a portfolio of more than 250 high-quality, full color images created especially for presentation. The images especially for presentation. The images have been designed to deliver quick, clean, visual impact against the colored backgrounds typically used in presentations. The subject categories are appropriate for any type of business presentation and include time and money icons, people in office-related situations, maps, computers, flags, backgrounds, and logos, to name a few. GRA0272 \$99.



Koala		
INP0127	MacVision 3.0	269
Kraft		
INP0094	Kraft ADB Trackball	79
Microspe	eed	
NP0126	MacTRAC ADB	75.
INP0140	MacTRAC DB9	62.
Microtek		
INP0112	Microtek MSF-300ZS Scanner	1998.
INP0176	ScanMaker 1850 S	2459.
	TrueLaser Printer	
MicroTo	uch	
@INP0084	The UnMouse	189
Mouse S	systems	
@INP0132	Little Mouse ADB	75
@INP0134	Trackball / ADB	69
Sophisti	cated Circuits	
	Power Key	64
Thunder	Ware	
INP0116	ThunderScan 400	385

MEMORY UPGRADES & ACCELERATORS

Connect	ix	
UTI0144	Virtual 030 2 0 UM3	113
DRI0185	Virtual 2 0 PMMU	
Daystar	Digital	
ODRI0224	64K FastCache IIci	289
ODRI0288	40 MHz PowerCache (Ilci)	979
@DRI0290	50 MHz PowerCache (Ilci)	1699
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Dove		
ODRI0130	MaraThon 030 (MacII)	599
ODRI0198	MaraThon 030 - (Mac SE)	399
O DRI0197	MaraThon 030 - (MacPlus)	399
O DRI0152	MaraThon 030X (Macllx)	599
	MaraThon 030 SE/030	
ODRI0380	Marathon Racer For Mac II	1079



Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Ask for details when you place your order.



SmartOne. 2400/1200 (Best Data Products)

When you need a 2400 baud modem, the SmartOne 2400/ 1200 provides an economical alternative. For less than the cost of some 1200 bps units, you get a Hayes compatible

modem with auto answer/originate, 300, 1200, and 2400 baud operation, passthrough phone jack, speaker with programmable volume, and a manufacturer's two year warranty. All user options are stored in non-volatile memory. Includes free Quicklink II communications software, modern, cable, and CompuServe/Prodigy Start-Up Kit offer MOD0021 \$139.

DHIDSAA	Mercury SUSI Module Pius	209
	MODEMS & FAX	
Abaton		
MOD0019	InterFax 12/48	265
MOD0034	InterFax 24/96	349
Applied	Engineering	
⊘ MOD005	4DataLink/Mac	209
Best Dat	a	
MOD0021	Smart0ne 2400/1200	139
Dove		
⊘ MOD003	8 DoveFax Desktop	299
⊘ MOD005	3 Dove Fax Plus	359
Global V	illage	
O MOD004	9 TelePort 2400 ADB Modern	145
	8 TelePort/Fax 9600	185
Hayes		
COM0023	Smartmodern 2400	349
M0D0017	Smartmodem 9600 (V series)	589
M0D0060		179
MOD0059	Ultra 96 w/ Smartcom II	799
Microco		
MOD0050	MacModem V 32 / 9600	689
PowerU:		
	2400 BPS Mini Modem	99
M0D0047		149
M0D0062	24/96 Mini Send/Receive Fax Modem	199

Prometh	eus	
MOD0052	9600M Plus Modem	599
M0D0046	ProModem 24/96 MSR	. 299
MOD0033	ProModern 2400 MFax	209
M0D0064	ProModem Ultima	. 699
MOD0035	TravelModem .	199
Shiva		
NET0067	NetModem V 32 (9600)	1169
Supra C	orporation	
M0D0020	SupraModem 2400	119

Puzzle Master

(Centron Software) Now you can use your Mac to solve crossword puzzles, or create your own puzzles for fun or Puzzle Master includes 250 of the classic New York Times puzzles, 200 Daily puzzles and 50 Sunday puzzles. No more erasing or scratching out changes! Built-in timer and scoring system allows you to test your skill against the experts. Get optional hints and answer checks if you get stuck. Save partial solutions, print puzzles, answers, dues. ENT0383 \$29.

MUSIC & SOUND

Coda Mu	isic Software	
MUS0044	Finale 2 6 1	549
Electron	ic Arts	
MUS0004	Deluxe Music Construction 2.5	85
Farallon	* Computing	
MUS0035	MacRecorder® 2.0	174
Opcode	Systems	
MUS0083	MIDI Translator	43.
Repertoi	re	
MUS0034	Music Publisher	359
Tactic S	oftware	
	Sound Clips Vol. 1, 2, 3 & 4	ea 49

FontCard NTX

A font expansion card for Apple's most powerful laser printer which adds the popular Adobe TypeSet 1, 2 and 3 PostScript language fonts to the LaserWriter IINTX. The card plugs directly into the font expansion connector on the NTX's controller board and becomes a resident part of the printer. The Sonnet FontCard NTX comes bundled with Adobe Type Manager software and Adobe TypeSet 1, 2 and 3 outline and bitmapped fonts for the Macintosh. **FON0410 \$469**.



QuadraLink (Applied Engineering)
QuadraLink solves the problem of clogged serial ports. Add four additional serial devices (printers, plotters, scanners, modems, etc.) to your Mac II. QuadraLink is compatible with Mac's Communication Toolbox, System 7.0 and includes a "shadow driver" to recognize older software. (Mac II family only) INP0148 \$209.

Magna UTI0166

UTI0146

QUTI0113

Microcom OUTI0093 Virex

OUTIO150 Virex 10-pack

Abbott Systems, Inc.

Dariana Software

Empower I

Empower II

Symantec Corporation
OUTIO214 Symantec Antivirus for Mac 3.0 (SAM) __65

UTILITIES & PROGRAMMING 59

359

52

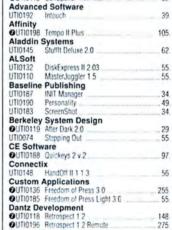
SECURITY & VIRUS PROTECTION

ASD Sol	tware, Inc.	
UTI0135	FileGuard 2.5	139
UTI0130	FileGuard 2.5 - Office Pack 5	499
UTI0131	FileGuard 2.5 - Office Pack 10	799
ACC0539	MaccessCard Reader	299

The New Hork Times

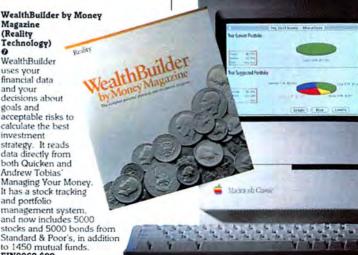
	tructus 5 Surface for Gretaly 8 Disposition 12 Pratotypish tiles 13 With the makes
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HINCZER RCENOSS DOUBLE	0124

Eifth Co.	neration System	
	DiskLock	118
Kensing		
ACC0235	Apple Security Kit	34
	PassProof	69
Kent Mar	rsh	
	MacSale II	107
	NightWatch 1.03	





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Lompuserve

the Electronic Mall on CombuServe. The MacWAREHOUSE GO code s GO MW As always, you'll st, dependable overnight service and or any of our support staff

Intouch (Advanced Software)

MacUser Magazine rates Intouch "the best name-and-address DA for the Mac," (4 1/2 mice). Intouch is an easy-to-use Macintosh Desk Accessory that stores unlimited names, addresses, phone numbers and notes, prints envelopes and labels, dials telephone numbers and more! Because Intouch is a DA, it provides you with instant access to your data. Create multiple datafiles, store up to 14 pages of notes for each contact, and automatically time and date stamp your notes. Network 3-pak now available. UTI0192 \$39.

Dubl-Cli	ck	
UTI0194	ClickChange	56
Fifth Ger	neration Systems	
O UTI0063	FastBack II 2.5	
O UTI0087	SuitCase II 1.2.1	49
UTI0035	SuperLaserSpool 2.02-Single User	93
ICOM Si	mulations, Inc.	
UT10084	On Cue	35
Insight D	Developement	
UT10098	MacPrint 1.2	. 95
Kent Ma		
O UTI0212	Folder Bolt	73
Magic S	oftware	
	Autosave II	26.

Kid Pix (Broderbund)

Kid Pix makes computer graphics fun.
Designed for kids ages 3-12, it includes
audio feedback and plenty of good humor.
The pencil scratches, the brush bloops, and the moving tool that sounds like a truck engine. Children using a Mac with voice input can record personal messages that play back whenever they open their painting. The Tools include a palette of animated Wacky Brushes. The Rubber Stamp lets kids create frogs, birds and other creative illustrations with a mouse click Imaginative erasers include a Black Hole and a Firecracker. GRA0268 \$29.



Malnetou

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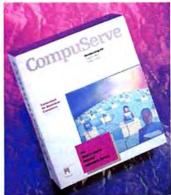
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WORDPROCESSORS & SPELLING CHECKERS

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CompuServe Membership Kit For the Macintosh

(CompuServe) The largest on-line data service, with over 500,000 users. Services include electronic mail, bulletin boards, special interest groups (Forums), and a discount department store. You can chat with other users in the CB mode, or check out the latest rumors in the gossip column. Databases include the complete text from major newspa-pers and encyclopedias, plus stock data, weather forecasts and book and movie reviews. The Membership Kit contains everything you need to get started, including credit against your first two hours on-line. COM0085 \$23.



Cutting Edge Hard Disk Drives (Cutting Edge) New enhanced Cutting Edge drives

New enhanced cutting edge drives deliver quiet, reliable memory with access times as low as 20ns. New features include two power outlet, 50-pin cables for easier daisy chaining, a

quieter fan, dual-fuse surge buffer and simplified operation manuals. Available in 20 MB to 80 MB. 20MB Only \$329, 30+MB Only \$339, 45+MB Only \$389, 60+MB Only \$399, 80+MB Only \$469.

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MiniFinders

Ft. Knox tttt

Ft. Knox is an excellent security utility. Supports two forms of encryption. Files or volumes can be "sanitized" to U.S. top-secret standards. Version 1.0.5 shipping. Requires Mac Plus or later, \$195. Transfinite Systems Co., P.O. Box N, MIT Branch Post Office, Cambridge, MA 02139. (617) 969-9570. (Nov '89)

MaccessCard Reader 1111

The MaccessCard is a magneticidentity-card reader that operates as part of the ADB circuitry and requires ASD's excellent File-Guard software. In conjunction with FileGuard, the reader prevents unauthorized access to either a Mac's entire hard disk or a specified selection of files, folders, applications, and partitions. Requires Mac SE or later, with FileGuard software. \$349. ASD Software, Inc., 4650 Arrow Hwy., E-6, Montclair, CA 91763. (714) 624-2594. (Apr '91) MacSafe \$\$\$\$

MacSafe is a data-file-security program that lets you put multiple files into a "safe," where you can protect them further through two types of encryption (including DES). Flexible and easy to use. Allows for installation on harddisk drive. Version 1.0 reviewed. Version 2.0 shipping, Requires Mac 512Ke or later, \$189.95, Kent Marsh Limited, Inc., 1200 Post Oak Blvd., Suite 210, Houston, TX 77056. (800) 325-3587 or (713) 623-8618. (Mar '87)

NightWatch \$\$\$\$ NightWatch locks up your harddisk drive by using a floppy startup disk that acts as a key. Type in the correct password, and access to the hard-disk drive is allowed. Version 1.02 reviewed. Version 1.03 shipping. Requires Mac 512Ke or later and a hard-disk drive, \$149.95. Kent Marsh Limited, Inc., 1200 Post Oak Blvd., Suite 210, Houston, TX 77056. (800) 325-3587 or (713) 623-8618. (Sept '88)

Rival tttt

Rival is an INIT that inspects open files for known viruses. Rival checks files constantly, but delays are hardly noticeable. Also scans disks and does some file repairs. Experienced users can easily add protection against newly discovered viruses. Version 1.0 shipping. \$99. Microseeds Publishing, Inc., 5801 Benjamin Ctr. Dr., Ste. 103, Tampa, FL 33634. (813) 882-8635. (Sept '90) SAM (Symantec AntiVirus for Magintosh) *****

Macintosh) ####

SAM (Symantec AntiVirus for Macintosh) is a clear step forward in virus protection. An easy upgrade procedure lets users upgrade SAM to fight new viruses by call-ing Symantec's 24-hour Virus Newsline. The INIT portion, SAM Intercept, has been improved slightly, but its interface has suffered in the process. Virus Clinic (the batch-checking application) provides a better interface and new power. Version 2.0.4 reviewed. Version 3.0 shipping. Requires Mac 512Ke or later and System 6.0.3 or later. \$99.95. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014. (800) 441-7234 or (408) 253-9600. (Aug '90) * '89 Eddy

SecureInit ttt

SecureInit locks files and folders, makes the System Folder invisible, erases files not on its userspecified approved list, locks disks after use, refreshes (replaces) specified files with clean copies after use, and password-protects everything. Also purges files as a disk fills up, but this is too dangerous to use in most cases. Particularly good at resisting efforts to bypass it. Version 2.3 shipping. Requires Mac Plus or later, \$99.95. Direct Software, Inc., 1032 Irving St., Ste. 513, San Francisco, CA 94122.(415)347-1590.(Aug '90)

Sentinel tttt Sentinel encrypts data files (or sets of files), using a supersecure DES or a superfast SuperCrypt algorithm. The program provides high-level security. Version 1.0 shipping. Requires Mac 512Ke or later. \$149.95. SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086. (408) 245-2202. (Apr '88)

Virex \$\$\$\$\$

Virex is a virus preventer, detector, and eradicator that works against known viruses. Excellent support and update history. Version 1.1a reviewed. Version 3.2 shipping. Requires Mac Plus or later and System 4.2 or later. \$99.95; 10-pack, \$599. Micro-com, Inc., P.O. Box 51489, Durham, NC 27717. (919) 490-1277. (Jan '90)



Better Working: The Resume

Kit 111 Better Working: The Resume Kit is a port of a popular DOS program. It does an adequate job of structuring simple résumés but ultimately isn't much better than a good word processor. Has a good manual and is a good place to start, but that's not really enough. Version 1.0 shipping. \$39.95. Spinnaker Software Corp., 201 Broadway, Cambridge, MA 02139. (800) 323-8088 or (617) 494-1200. (July '90)

DocuComp tttt/2

DocuComp is a utility that lets you compare two versions of a word-processing document. Inserted text in the newer document is shown with underlining, and moved text appears in boldface. Older document shows deleted and moved text with strikeover characters. An excellent report-

ing feature details all revisions made to a document. A definite winner, DocuComp supports popular word-processing appli-cations such as Microsoft Word. Version 1.5 reviewed. Requires Mac Plus or later and System 6.0 or later (hard-disk drive recommended), \$159.95. Advanced Software, Inc., 1095 E. Duane Ave., Ste. 103, Sunnyvale, CA 94086. (800) 346-5392 or (408) 733-0745. (Feb '91)

EndNote tttt/2

EndNote provides database management for bibliographies. It's designed to work in conjunction with a word processor. Allows for formatted in-text citations to be pasted directly into a word-processing document and then creates a bibliography from the citations. Version 1.0 reviewed. Version 1.3 shipping. Requires Mac 512Ke or later. \$149. Niles & Associates, Inc., 2000 Hearst St., Ste. 200, Berkeley, CA 94709.

(415) 655-6666. (Feb '89) Hot Keys (MacWrite II

version) \$\$\$\% Hot Keys is a set of MacroMaker macros for MacWrite II. Versions for Works and PageMaker are also available. Includes utility macro software and a keyboard overlay. Has numerous useful macros, including some for the Finder. Version 1.0 shipping. Requires System 6.0.3 or later, MacroMaker (included), and extended keyboard. Each version, \$44.95. K.I.S.S. (Keep It Simple Software), 324 Fuller, Ste. C-3, Helena, MT 59601. (406) 442-3559. (Jan '90)

LetterWorks \$\$\$\$

LetterWorks is a book of 401 sample business letters. Letters come in text format on-disk so any word-processing program can open them. Version 1.0 shipping. \$79.95. Round Lake Publishing, Inc., 31 Bailey Ave., Ridgefield, CT 06877. (203) 438-5255. (Mar

Mishu \$\$\$\$%

Mishu is a DA that turns MacWrite and Microsoft Word into a Chinese word processor. It also works with Cricket Draw, HyperCard, or any program that reads PICT files. Slow on long documents. Only simplified characters. Version 2.1 reviewed. Requires Mac 512K or later, MacWrite 3.5 or later, and Word 3.0 or later, \$89. Xanatech, Inc., 20 Fresh Pond Place, Cambridge, MA 02138. (617) 492-7463. (May '89) Stylist \$\$\$\$

Stylist is a utility that deciphers and fully describes formatting style sheets in Microsoft Word. Although you can't alter Word style sheets from within Stylist, you can dissect style sheets created by other Word users. A set of useful predesigned style sheets and a supplementary electronic dictionary of computer terms (to use

with Word's spelling checker) are included. Version 1.0 reviewed. \$79.95. SNA, P.O. Box 3662, Princeton, NJ 08543. (800) 628-6442 or (609) 799-9605. (Feb '91) Writer's Dreamtools \$\$\$\$\%

Writer's Dreamtools is a set of five highly informative Hyper-Card stacks. The Clichés and Catchphrases stack is fascinating. There's also a Slang stack plus Events Day by Day, the Stack of Decades, and the Stack of Lists. Comes in G- and X-rated versions. Requires HyperCard 2.0 (included) and a hard-disk drive. Five-stack set, \$149. Slippery Disks, P.O. Box 1126, Los Angeles, CA 90069. (800) 522-7234 or (213) 274-3600. (May '90)

OCR

AccuText ttt

AccuText is an automatic, omnifont OCR program built on several expert systems that combine shape and context analysis. Can read poorly copied, multipage documents. Its preview window is for manually selecting and arranging blocks of text to recognize. Good page-format preservation. No built-in editor for viewing recognized text before saving to a file. Version 1.1 shipping. Requires Mac SE with 68020 accelerator card, SE/30 or II series with 4 MB of RAM (5 MB under MultiFinder), System 6.0.3 or later, and a 20-MB hard-disk drive. \$799. Xerox Imaging Systems, 185 Albany St., Cambridge, MA 02139. (800) 248-6550. (July '90)

CDP 9000/TopScan for the

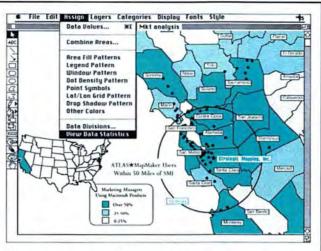
Macintosh \$555 The CDP 9000/Top Scan consists of the CDP 9000 (a large scanner that connects to your Mac with a SCSI cable) and TopScan software, which installs on your hard disk. Recognition processing is blazingly fast and highly accurate. Attractive Mac interface, including a window that previews the current page. Requires Mac Plus or later with a hard-disk drive. Scanner and software, \$31,950. Calera Recognition Systems, 2500 Augustine Dr., Santa Clara, CA 95054. (800) 544-7051 or (408) 986-8746. (Nov '90)

OmniDraft \$\$\$\$%

OmniDraft is an add-on that improves OmniPage's ability to recognize dot-matrix characters. OmniDraft becomes part of OmniPage after installation and adds a check box for dot-matrixtext recognition. Produces fairly accurate scans. Version 1.0 shipping. Requires OmniPage 2.1. \$100. Caere, 100 Cooper Ct., Los Gatos, CA 95030. (800) 535-7226. (Sept '90)

OmniPage \$\$\$\$% OmniPage is an automatic omnifont OCR program. Works best on complex magazine pages. Strict adherence to shape analysis avoids most substitution errors.

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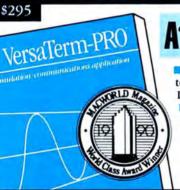


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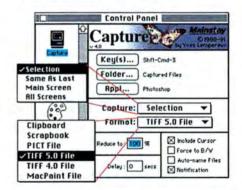


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Minifinders

Fast and accurate on most pages. Supports a variety of scanners, languages, and output files. Not good with text on poor-quality paper. Little manual control of text-block shape, position, or recognition order. Preserves little of a document's format. Requires a page to be scanned twice to save text and graphics. Version 2.1 reviewed. Requires Mac SE with 62080 accelerator card, SE/30, or II series with 4 MB of RAM (5 MB under MultiFinder) and System 4.2 or later, \$795. Caere, 100 Cooper Ct., Los Gatos, CA 95030. (800) 535-7226 or (408) 395-7000. (July '90) * '89 Eddy

OmniProof \$\$\$%

OmniProof is a document-comparison program that compares any two versions of a file and gives a detailed report that shows where text has been moved, deleted, or changed. Can also print documents with revision bars to show editing. Sold as a compan-ion to OmniPage but is a separate program. Version 1.0 shipping. \$150. Caere, 100 Cooper Ct., Los Gatos, CA 95030. (800) 535-7226. (Sept '90)

Parallel Reader ###

The Parallel Reader is a hardware/ software combo that is Caere's bid for the corporate high-end OCR market, It is actually an IBMcompatible PC that you network to your Mac. You must add on one of the three scanners it supports (Fujitsu 3093, HP ScanJet Plus, or Microtek MSII). The Parallel Reader forces you to do DOS and transfer your files into Mac format. Speeds up multipage OCR work and allows batch-deferred processing. Requires scanner, an auto document feeder, PC keyboard and monitor, and Mac/PC communications cable and software, \$10,995. Caere, 100 Cooper Ct., Los Gatos, CA 95030. (800) 535-7226. (Nov '90)

Read-It! ####

Read-It! is an OCR package that includes printer drivers for most scanners, batch processing, background operation under Multi-Finder, and 22 font tables. Recognizes multiple columns, italics, and some foreign characters but not underlined text. Version 2.0 reviewed. Version 2.1 shipping. Requires Mac Plus or later and a scanner. \$495. Olduvai Corp., 7520 Red Rd., Ste. A, South Miami, FL 33143. (800) 822-0772 or (305) 665-4665. (June '89)

TextPert \$\$\$%

TextPert is a trainable OCR package with acceptable accuracy. Needs to learn fonts. Supports more than 30 languages but in roman fonts only. Directly supports popular scanners. Version 3.0 reviewed. Version 3.5 shipping. Requires Mac Plus or later, a high-resolution (at least 200dpi) scanner, and a hard-disk drive. \$995. CTA, 747 Third Ave., Third Floor, New York, NY 10017. (800) 252-1442 or (212) 935-2280. (Oct '89)

Typist \$\$

Although this unique, hand-held OCR scanner can input text directly into a Mac application, its finicky character-recognition performance makes it hard to recommend. The software processes about 500 wpm, but the resulting text contains many errors. Our testing found software incompatibilities and SCSI conflicts. The software accepts different type styles and sizes, but performance doesn't compare with standard OCR software using a good flatbed scanner. Version 1.0 reviewed. 4 MB of RAM recommended. \$695. Caere, 100 Cooper Ct., Los Gatos, CA 95030. (800) 535-7226. (Mar '91)

SPELLING & GRAMMAR CHECKERS

Correct Grammar ####

Correct Grammar is an excellent Mac grammar checker. This rulebased application handles a wide variety of input. The interface is good, although some of the type is too small. Customization is easy and necessary. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later, harddisk drive, and System 4.2 or later. \$99. Lifetree Software, Inc., 33 New Montgomery St., Ste. 1260, San Francisco, CA 94105. (800) 543-3873 or (415) 541-7864. (Jun

Graham Speller \$\$\$

Graham Speller is a DA-based spelling checker with a macro feature. Clumsy interface. Version 1.1 reviewed. Requires Mac 512Ke or later. \$44.95. Graham Software Co., 8609 Ingalls Cir., Arvada, CO 80003. (303) 422-0757. (Sept '88) Grammatik Mac \$\$\$\%

Grammatik Mac is a port from DOS that has an ugly, awkward interface. The grammar-checking abilities, which are overshadowed by the interface, are quite good. Customization is reasonably easy. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later. \$99. Reference Software International, 330 Townsend St., Ste. 123, San Francisco, CA 94107. (800) 872-9933 or (415) 541-0222. (Jun '90)

Inside Information \$\$\$

Inside Information is a "hierarchical dictionary" that provides large categories of words you can search through in almost the same way as you do a thesaurus. But it lets you explore subjects, much as a library's traditional card catalog does. It has three search views: outline (with expandable/collapsible headings), the tree view, and the more-intuitive graphic view. A Reverse Dictionary function lets you search for words according to your definition. This feature, as

does the overall utility, needs refinement and expansion. Version 1.0 reviewed, \$119. Microlytics, Inc., Two Tobey Village Office Park, Pittsford, NY 14534. (800) 828-6293 or (716) 248-9150. (Feb

Language Master 111/2

Language Master is an electronic dictionary/thesaurus in a DA. The dictionary has definitions, hyphenation points, and part-ofspeech information for more than 83,000 entries. The thesaurus has 40,000 unique entry points with synonym information for different parts of speech. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later, System 6.0.3 or later, and a hard-disk drive. \$79.95. Franklin Electronic Publishers, Inc., 122 Burrs Rd., Mount Holly, NJ 08060, (800) 543-3511, (Jan '90)

Microsoft Foreign-Language Dictionaries tttt

Microsoft provides electronic dictionaries for use with Word 4.0: British (as opposed to U.S. English), French, Spanish, German, Italian, Swedish, and Dutch. Each dictionary acts as a replacement for the standard U.S. English dictionary, so you can use only one dictionary at a time. Without trying to include every word in each available foreign language, these dictionaries can catch misspellings, incorrect placement of tildes, and even incorrect accents marks. Requires Microsoft Word 4.0, \$75 each. Microsoft Corp., One Microsoft Way, Redmond, WA 98052. (800) 426-9400 or (206) 882-8080. (Feb

RightWriter ###

This grammar checker is strong on checking but flawed on presentation. Works well with Multi-Finder. Format compatible with all versions of MacWrite (2.2 to 5.0); MacWrite II; Word 3.0 and 4.0; WordPerfect 1.0.0 to 1.0.4; WriteNow 1.07, 2.0, and 2.2; and all text editors. It is fully customizable. Relevant text should be more clearly delineated. Version 3.10 reviewed. Requires Mac Plus or later with hard-disk drive. \$95. QUE Software, 11711 N. College Ave., Carmel, IN 46032. (800) 992-0244 or (317) 571-3465. (Aug

Sensible Grammar 111%

Sensible Grammar is a useful proofreading program based on phrase lists instead of on word lists and rules. Grammar-checking abilities are slightly above average. Simple operation, but you work on the original document, which can be confusing. Lack of a spelling checker is a handicap. Version 1.0 reviewed. Version 1.6.2 shipping. Requires Mac Plus or later and System 5.0 or later. \$99.95; upgrade, \$25. Sensible Software, Inc., 335 E. Big Beaver, Ste. 207, Troy, MI 48083.

(313) 528-1950. (Dec '88) Spelling Coach Professional

Spelling Coach Professional 3.0 is a good, powerful spelling checker. New features include a redesigned and much-improved control panel, clearer dialog boxes, greater flexibility in keyboardcommand-equivalent assignments, and Deneba's Big Thesaurus - the best available. Coach can check spelling in batches or interactively. The program's main drawback is that it takes time and effort to learn. Version 3.0 reviewed. Version 3.1 shipping. Requires Mac Plus or later, System 5 or later, and a hard-disk drive. \$195. Deneba Software, 3305 N.W. 74th Ave., Miami, FL 33122. (800) 622-6827 or (305) 594-6965. (May '90)

Spellswell #### Spellswell is a stand-alone batch spelling checker. Also checks for punctuation and other errors. Good dictionary, thorough checking, and simple interface but weak guessing. Excellent performance. Version 2.0f reviewed. Version 2.2 shipping. Requires Mac 512Ke or later. \$74.95. Working Software, Inc., P.O. Box 1844, Santa Cruz, CA 95061. (408) 423-5696.

(Sept '88) ★ '86 Eddy TechWords ###

TechWords is a set of seven supplementary dictionaries for use with Microsoft Word. The dictionaries cover scientific areas such as chemistry, physics, life sciences, and computer technology. Word correctly identifies terms contained in these supplementary dictionaries, but such words aren't listed as alternatives when you find incorrect words, using Word's spelling checker. \$79. Geocomp, 66 Commonwealth Ave., Concord, MA 01742. (508) 369-8304. (Feb '91)

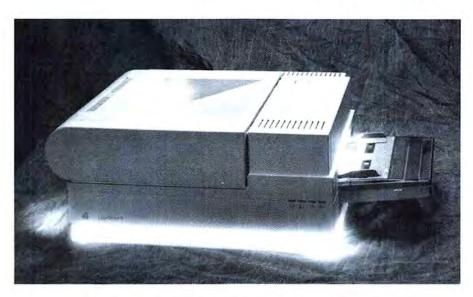
Thunder II tttt/2

Thunder II is a major upgrade of Thunder!, the popular spelling checker. An INIT/control panel, Thunder II launches at startup. Users select the dictionaries and applications with which it should run. Checks for spelling, punctuation, capitalization, and doubleword errors. Includes applicationspecific "compatibility modules" to retain character formatting. Editable glossary. Version 1.1 reviewed. Requires Mac Plus or later and System 5.0 or later, \$99.95. Baseline Publishing, 1770 Moriah Woods Blvd., Ste. 14, Memphis, TN 38117. (800) 926-9676 or (901) 682-9676. (Oct '89) * '86

Word Finder 111%

Word Finder is an electronic thesaurus that won't replace your trusty Roget's but is useful for checking synonyms on the fly. Version 2.0 reviewed. Requires Mac Plus or later and System 6.0.3 or later. \$59.95. Microlytics, Inc.,

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Two Tobey Village Office Park, Pittsford, NY 14534. (800) 828-6293 or (716) 248-9150. (Feb '90)

WorksPlus Spell 1111/2 WorksPlus Spell is a speedy spelling and hyphenation checker for Microsoft Works. It includes a glossary for abbreviations and time/date stamping. Limited to use with Works only. Version 2.0 shipping. Requires Microsoft Works, \$99.95. Lundeen & Associates, P.O. Box 30038, Oakland, CA 94604. (800) 233-6851 or (415) 893-7587, (Oct '87) * '87 Eddy

WORD PROCESSORS

Feima ttt/2

Feima is a Chinese word processor that lets users create their own Chinese ideograms. Good Macintosh interface. Users can create characters for those that aren't included in the dictionary. Copyprotected. Version 4.1 shipping. Requires Mac 512Ke or later. \$595. Wu Corp., P.O. Box 699, Avon, CT 06001. (203) 677-1528.

FullWrite Professional ####

Stable and easier to use than previous versions, FullWrite Professional 1.5 combines outlining and word processing with page-layout and drawing capabilities, but it lacks some professional features. The program can import documents created in some versions of Word, MacWrite, Word-Perfect (for PCs or Mac), Multimate, and Advantage; many of these conversions are made via a separate program, Word for Word. Also included is Tycho Table Maker, which creates tables that are suitable for pasting into (but not editing in) FullWrite Professional. Version 1.5 reviewed. Requires Mac Plus or later with 2 MB of RAM and a hard-disk drive. \$395. Ashton-Tate Corp., 20101 Hamilton Ave., Torrance, CA 90502. (800) 437-4329 or (213) 329-8000. (Apr '91)

Letter Writer Plus tttt/

Letter Writer Plus is a DA for creating correspondence on the fly. It can use Address Book Plus files as well as text and commaand tab-delimited files. The interface of this large DA has some rough edges. Excellent envelope printer and mail-merge facility. Good text handling. Version 1.0 reviewed. Version 1.0 shipping. Requires Mac Plus or later, \$89.95. Power Up Software Corp., 2929 Campus Dr., San Mateo, CA 94403. (800) 851-2917 or (415) 345-5900. (May '90)

MacWrite II \$\$\$\$%

MacWrite II is MacWrite's first major upgrade, offering a big increase in power along with an excellent interface. Now there's a Search/Replace function plus elegant multiple-column and mailmerge features. Performs sluggishly on Pluses, SEs, and Classics. With its open hooks for PCand-Mac file translators, Mac-Write II is an excellent choice for mixed environments. Allows only one header and footer per document. Version 1.0 reviewed. Version 1.1v1 shipping. Requires Mac Plus or later. \$249. Claris Corp., 5201 Patrick Henry Dr., Santa Clara, CA 95052. (800) 544-8554 or (408) 727-8227. (Jan '91) '85 Eddy

MindWrite tttt

MindWrite integrates outlining and word-processing functions. Sophisticated Search and Select options. Slow performance. Version 1.1 reviewed. Version 2.1 shipping. Requires System 6.0.3 or later, \$195. DeltaPoint, Inc., 2 Harris Court, Ste. B-1, Monterey, CA 93940. (800) 367-4334 or (408) 648-4000. (Feb '88)

Nisus tttt/2

This high-end word processor has an intuitive design and is easy to learn, but it has a range of menu options that will intimidate novices (no Short Menus option is provided). The program is aimed at technically proficient users who need extensive control over long documents. Graphics handling has been greatly improved and now includes Page Graphics, a surprisingly powerful system with basic DTP functions. Part of Nisus' power is due to its extensive searching and macro capabilities. File size is limited primarily by the Mac's available RAM. Version 3.01 reviewed. Version 3.05 shipping. Requires Mac Plus or later (hard-disk drive recommended). \$395. Paragon Concepts, Inc., 990 Highland Dr., #312, Solana Beach, CA 92075. (800) 922-2993 or (619) 481-1477. (Mar '91)

Pro-Cite ttt/2

Pro-Cite is a complete databasemanagement system for bibliographies. Almost unlimited flexibility in bibliography formatting. Full-featured search and sort capabilities. Overly complicated and nonintuitive use of menu bar and dialog boxes. Version 1.3 reviewed. Version 1.34 shipping. Requires Mac 512Ke or later and System 4.1 or later (hard-disk drive recommended). \$395. Personal Bibliographic Software, Inc., P.O. Box 4250, Ann Arbor, MI 48106. (313) 996-1580. (Feb '89

QUED/M tttt/2

QUED/M is an excellent DA text editor. Saves documents in a form readable by most computers and printers. Doesn't support graphics or multiple fonts. Programming language allows database creation. Can build complex search-andreplace patterns. Macros feature lets it function as appointment book or text database. Version 2.07 reviewed. Version 2.09 shipping. Requires Mac 512Ke or later.

\$119. Paragon Concepts, Inc., 990 Highland Dr., #312, Solana Beach, CA 92075. (800) 922-2993 or (619) 481-1477. (Feb '90)

QuickLetter ####

QuickLetter is a well-designed and thoughtfully implemented DA for creating letters and envelopes. Creates stationery, complete with graphics, and maintains an address book that includes salutations. Version 1.0 reviewed. Version 1.1.5 shipping. Requires Mac 512Ke or later. \$124.95. Working Software, Inc., P.O. Box 1844, Santa Cruz, CA 95061. (408) 423-5696. (Apr '89)

RésumExpert ***

RésumExpert is a set of résumé templates with a superb manual. Versions for Word 1.05 (shudder) and Works are available at the same price. Requires Mac 512Ke or later and Word 3.02 or later. \$95. A Lasting Impression, 49 Thornberry Rd., Winchester, MA 01890. (617) 721-2037. (Oct '89)

Taste tttt

Taste is a midrange word processor that also provides excellent color drawing tools and simple database functions. Graphics features include Bezier curves, color gradient fills, transparent editing while also viewing the surrounding text, and automatic text wrap inside or outside graphic borders. Database features are oriented toward name-and-address management, but resulting mail-merge capability is well implemented. Imports and exports most popular word-processing formats. Lacks advanced features but easy to use. Version 1.01 reviewed. Requires Mac Plus or later with 2 MB of RAM, System 6.0.2 or later, and a hard-disk drive. \$149. DeltaPoint, Inc., 2 Harris Court, Ste. B-1, Monterey, CA 93940. (800) 367-4334 or (408) 648-4000. (July '91)

Vantage \$\$\$\$ Vantage is a text-editor DA and the commercial version of the shareware program McSink. Changes case; counts the number of lines, words, sentences, or paragraphs in a selection; and searches and replaces on character strings (including invisibles). Supports macros and external commands written in Pascal. Includes a spelling checker. Version 1.12 reviewed. Version 1.5.1 shipping. Requires Mac 512Ke or later. \$99.95. Baseline Publishing, 1770 Moriah Woods Blvd., Ste. 14, Memphis, TN 38117. (800) 926-9676 or (901) 682-

9676. (July '89) Word tttt/2

Word 4.0 has excellent speed and a huge list of useful features. Table command lets you create multicolumn tables of text and graphics easily. Has hot links to Excel and Microsoft Mail. Includes enough DTP capabilities to format almost any document without compromising its performance as a dedicated word processor. Version 4.0 reviewed. Version 4.0B shipping. Requires Mac 512Ke or later, System 6.0.3 or later, and a harddisk drive, \$395. Microsoft Corp., One Microsoft Way, Redmond, WA 98052. (800) 426-9400 or (206) 882-8080, (Feb '90) * '89 Eddy

WordMaker \$\$\$%

WordMaker first appeared as an Amiga word processor called ProWrite. This inexpensive, lowkey program has an interface similar to the original MacWrite's. Supports up to ten open documents, imported color graphics, and mail-merge but has limited features and import capabilities. Good manual. If you share documents with a variety of other Mac users, you might prefer Word, MacWrite II, or WriteNow, Version 1.01 reviewed, Requires Mac 512Ke or later and System 4.1 or later. \$124.95. New Horizons Software, Inc., 206 Wild Basin Rd., #109, Austin, TX 78746. (512) 328-6650. (Jan '91)

WordPerfect tttt

This substantially improved version of WordPerfect is a good choice for offices needing PC compatibility. Doesn't have many of the awkward interface problems of previous versions. Good internal file-management system, graphics manipulation, and macro maker. WordPerfect excels at multiple, varied-width columns and basic page-layout functions. Limited typographic controls. Mac word-processing professionals may prefer the speed and reliability of Microsoft Word, which also has a PC/Mac filetranslation system. Version 2.0 reviewed. \$495. WordPerfect Corp., 1555 N. Technology Way, Orem, UT 84057. (800) 321-4566 or (801) 225-5000. (June '91)

Write \$\$\$ Microsoft Write is a low-level word processor. Big problems in multiple-column mode. No dynamic pagination. Poor value and an expensive upgrade path to Word. Version 1.0 reviewed. Requires Mac 512Ke or later (second floppy drive recom-mended), \$125. Microsoft Corp., One Microsoft Way, Redmond, WA 98052. (800) 426-9400 or (206) 882-8080. (May '88)

WriteNow \$\$\$\$1/2

This fast, reasonably priced word processor comes bundled with Grammatik Mac 2.0 (which includes a 1.4-million-word thesaurus) and templates for Avery mailing labels. Easy to learn and use, WriteNow allows multiple headers and footers. You can't set top and bottom margins, and multiple columns are limited to four. Version 2.2 reviewed. Requires Mac Plus or later. \$199. T/Maker Co., 1390 Villa St., Mountain View, CA 94041. (415) 962-0195. (Jan '91) ★ '86, '88 Eddy 🛱

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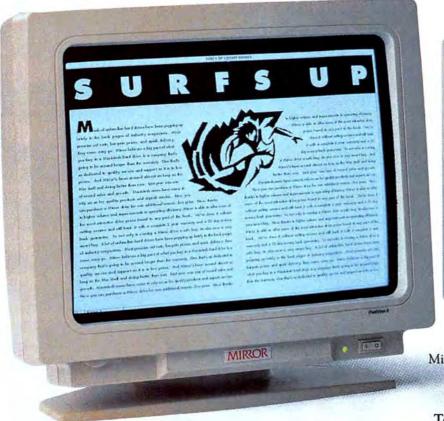
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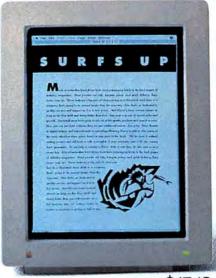
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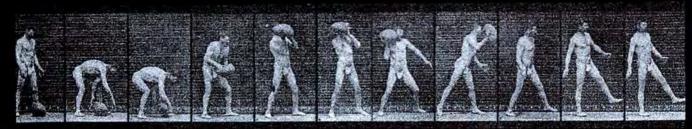




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Thinking of setting up your own DTP business? Then grab a copy of Desktop Publishing Success. Authors Felix Kramer and Maggie Lovaas cover every aspect of establishing and running a DTP operation, including assessing equipment needs, finding customers, pricing and bidding, working efficiently, subcontracting, and accounting. There are even profiles of successful desktop publishers and an appendix on doing corporate DTP. It's well worth the \$27.50 investment. (800) 541-2318.

By Aileen Abernathy

ATM for graphics? Well, maybe. Ray Dream — best known for Ray Dream Designer, its 3-D modeler/renderer — has introduced JAG, a \$99.95 utility that uses anti-aliasing to eliminate the jaggies in 8- and 24-bit PICT images and PICS animations (TIFF users are out of luck). JAG stands for jaggies are gone, and it works by averaging pixels along the detected edges of an image. (415) 960-0765.



⊗ Want to transform your scanned photos or paintings into sophisticated *art* but lack the talent or the wherewithal for an expensive graphics package? Check out Aldus' Gallery Effects, which offers classy special effects at a budget price (\$199). Gallery Effects performs its magic on TIFF and PICT2

images as well as on PICS animations. Volume 1: Classic Art offers 16 customizable effects, including chalk, charcoal, watercolor, emboss, and graphic pen (shown here). The program comes in *four* formats: an application; a DA; an XCMD for SuperCard and HyperCard 2.0; and plug-in modules for Photoshop, Digital Darkroom, and SuperPaint (for an as-yet-unreleased version!). From Silicon Beach Software (an Aldus subsidiary). (619) 695-6956.

Fonts, fonts, fonts: Don't expect to see any Adobe Originals fonts in TrueType format (surprise, surprise). After trumping Apple with its Multiple Masters strategy, Adobe announced that it holds the exclusive license to digitize typefaces

from Berthold, Europe's leading type vendor. Linotype previously released some Berthold faces, including Walbaum and Post Antiqua, but Adobe will be the sole distributor of all future faces. First out: Imago, Nofret, and Formata. ⊗ MasterWorks Type Library, Volume 1, is the first offering from Digital Typeface Corp., the font foundry owned by LaserMaster (best known for its plain-paper imagesetters). The collection of 100 Type 1 fonts (culled from the DTC, URW,



and ITC foundries) has serif, sans serif, decorative, and script faces. Type families include such illustrious names as ITC Clearface, ITC Souvenir, and URW Antiqua. Retail price is \$1,695 (that's \$16.95 per face). (612) 943-8920.

Updates: The Oasis/Wacom Image Creation Kit gives you a copy of Oasis and a Wacom 6-x-9-inch graphics tablet with a cordless, pressure-sensitive stylus for just \$1,195. Oasis, a 32-bit painting program, offers pressure-sensitive tools that let you mimic traditional art media. (707) 576-7722. ⊗ The shipping dates for QuarkXPress versions for non-Mac platforms have slipped to the end of 1991 and beyond. First out will be the Windows version, followed by OS/2. Quark is hedging its bets on whether it will actually ship the NeXT version it announced last fall. Apparently, demand hasn't justified the development costs thus far. ⋈



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PostScript Type Tricks

The new versions of Illustrator and FreeHand make it a snap to create snazzy display type.

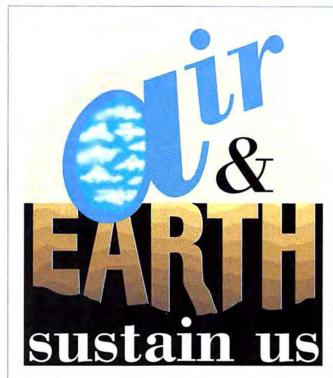
By Janet Ashford

reating imaginative display type on a computer hasn't al-ways been easy. Although you could add basic colored fills and strokes to PostScript fonts, using Illustrator or Free Hand, you couldn't fill the characters with blends, patterns, or bit-mapped art without first converting them to graphic outlines with programs such as Metamorphosis, Evolution, or TypeStyler.

TypeStyler offers several canned effects (graduated blends, for example) that can be added instantly to all the characters, but it doesn't have the flexibility of a PostScript drawing program. And in Illustrator 88, you had to paste a custom fill into the letters one at a time and use various tricks to keep the counters (the enclosed spaces in letters such as *A*, *D*, and *P*) from filling up.

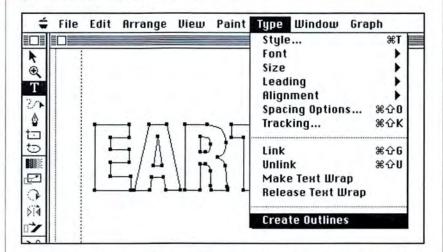
Happily, the 3.0 versions of Illustrator and FreeHand make creating display type a snap. Both programs can automatically convert PostScript type to outlines, and they can link outlines to form a multiple clipping path that you can use as a mask. This feature lets you paste a fill into several characters at once, and it automatically keeps the counters unfilled and transparent.

Graphic designer Janet Ashford coauthored *The Verbum Book of PostScript Illustration*.



Special effects with type: For this example, created in Illustrator 3.0, a sixstep blend was placed into the word EARTH and a cloud image created in Photoshop was masked into the counter of the letter a in air.

Converting Text to Outlines



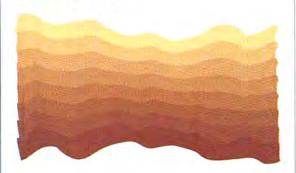
In Illustrator 3.0, the word *EARTH* is set in Helvetica Condensed Black. The text is selected, and Create Outlines is chosen from the Type menu. This command automatically converts the characters into editable outlines, complete with Bezier points. Because the text is now a graphic element instead of a font, it will print correctly even if the corresponding fonts are no longer available.

STEP BY STEP

EEditing the Outlines

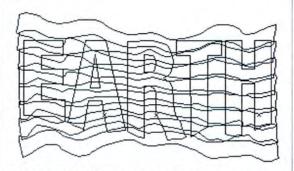
The text is modified to create a jagged bottom edge. The bottom segment(s) of each letter is clipped away with the scissors tool (top). A wavy line is drawn, and the endpoints of each letter are dragged down to meet it (center). The line is deleted, and the letterforms are closed when new baselines are drawn between the endpoints (bottom).

Creating a Blend



Two wavy horizontal shapes are drawn with the freehand tool, colored gold and dark brown, and positioned one above the other. Using the blend tool, the artist executes a six-step blend between the shapes. The small number of steps creates a visibly banded, striated look reminiscent of the layers of the earth's crust.

Masking the Blend



The letters of EARTH are selected and turned into a multiple clipping path when Make Compound is chosen from the Paint menu and the Mask box is checked in the Paint Style dialog box. The letters are positioned over the blend, sent to the back, and then grouped with the blend to create the masked effect. The combined elements are shown here in Artwork Only mode.

Adding a Background



Each letter now contains a portion of the blend. A solid black rectangle is placed behind the letters to set off their colors. The complete blend is still visible in Artwork Only mode, but in Preview mode, it does not appear in any areas outside the clipping path. The open counters in the A and B allow the black background to show through.

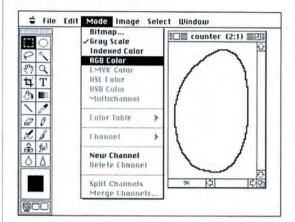
6 Creating More Text



OJIT

The word air is set in Bodoni Italic and rotated. The letters are converted to outlines and repositioned so that the top lines of the large a and two smaller letters are aligned and the dot is tucked closer to the i. Finally, the counter in the a is enlarged.

Preparing Another Image



A copy of the a's counter is saved as a separate EPS file and opened in Photoshop, where it is converted to a bit map. This outline serves as the basic shape for a new image. To add color to the image, its mode must be changed to RGB Color.

Painting a Custom Pattern



The artist dumps solid blue into the shape's outline and interior and then uses the airbrush tool to paint clouds. Painting around the outline with the brush tool ensures that the image will paste back into the counter in the Illustrator text without leaving gaps. The cloud image is saved as an EPS file so that it can be placed in Illustrator.

Masking the Clouds





The cloud image is brought into Illustrator, by use of the Place Art command, and positioned over the counter in the letter a. In Artwork Only mode, the cloud shape is represented by a placeholder box (left), but the actual artwork is visible in Preview mode (right). The counter outline is defined as a mask, sent to the back, and then grouped with the cloud shape to produce the finished effect.

10 Completing the Image



The final touches include overlapping the air and EARTH images slightly, drawing a tan circle and sending it to the back as a background, and adding more text in Bodoni. To ensure that the cloud image prints when the Illustrator document is placed in a page-layout program, the Include Placed Images box is checked when the Illustrator file is saved. (Note that the placed art is still linked to the Photoshop file, which must be kept with the finished artwork.)



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Do people care about standards? People do. Compaq, Digital, MIPS, Microsoft, Santa Cruz Operation (SCO), Silicon Graphics, and Sony, among others, have signed on to the Advanced Computing Environment initiative. The basic idea: interoperability across platforms through common hardware and operating systems. CPU: Intel x86 or MIPS RISC chips. OS: Open Desktop UNIX, from SCO, or OS/2 3.0 (which runs DOS and Windows apps), from Microsoft. And Apple? Well, some people adopt standards. Others make Macs.

By Henry Bortman

Routers on parade: Cayman has upgraded its GatorBox LocalTalk-to-Ethernet router; it's now the GatorBox CS. The CS has EPROM chips that store information about the router's configuration so that if there's a power outage, it can reestablish itself automatically. (The old GatorBox had to reload its configuration from a Mac on the network.) The CS circuit board is also available as

GatorMIM CS, a plug-in module for Cabletron's Multi Media Access Center hubs. The MMAC can simultaneously support Ethernet, token ring, and FDDI (a fiberoptic-network interface). \$2,795 for either the GatorBox CS or the GatorMIM CS. And coming soon to a GatorBox near you: DECnet Level 1 routing and an optional rack-mountable design.

Webster will also offer DECnet Level 1 routing on its MultiPort Gateway. Look for this upgrade by early fall. The currently shipping unit (\$4,995) routes AppleTalk traffic among an Ethernet port and *four* LocalTalk ports. A DMA controller lets all four LocalTalk ports be active

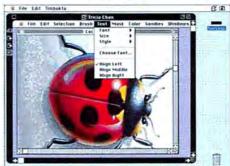


at once. The MultiPort Gateway also functions as a TCP/IP gateway. (800) 457-0903. * Meanwhile, the venerable FastPath, which used to be the only game in town for DECnet routing, has moved up to version 5, the first major upgrade of this LocalTalk-to-Ethernet router since Shiva acquired it from Novell. The new rev sports separate processors for AppleTalk I/O, similar to those in the Macintosh IIfx; PROMs; interchangeable media-interface modules, for easy support of 10BASE-T; and (hallelujah!) greatly improved management software. \$2,799.

Print jobs in a queue: Looking for something to do with your old Mac Pluses? Try running Compumation's Print Central network print-spooler software. Print Central can support up to six output devices from as many as eight print queues. And — how come nobody thought of this before? — it automatically resolves Laser Prep conflicts, eliminating the endless printer resetting that many users are painfully familiar with. \$795. (814) 238-2120.

Colors across a network: Timbuktu 4.0 is now shipping. This new version, which is System 7.0-compatible, lets users share color and gray-scale screens,

with appropriate dithering. (Previous versions displayed remote screens only in black-and-white.) It's not a speed demon, but it is an impressive bit of engineering. Also in 4.0: An Exchange Clipboard feature, for machine-to-machine cut-and-paste, and fully backgroundable file transfers. \$195; upgrade, \$35.



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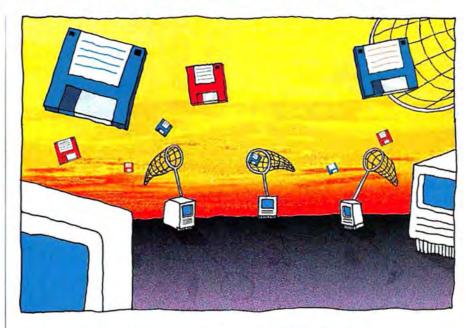
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Disks of a Different Color

DOS disks deserve the same respect Mac disks get, so go ahead—
mount them on your desktop.

By John Rizzo



onnectivity is always more complicated than it seems. Take the simple matter of floppy disks. A Mac with a SuperDrive can read DOS disks, yet when you stick a DOS floppy into the drive, your Mac asks if you want to initialize the disk. The reason for this apparent contradiction is that although the SuperDrive can read a DOS disk, as advertised, the Mac's operating system can't (the SuperDrive is standard in all Macs made today but did not ship in the Mac Plus and earlier models or in older SEs). The System is trained to recognize only disks formatted in HFS (hierarchical file system) — anything else looks like gibberish to it.

Apple's solution is AFE (Apple File Exchange), which comes with the standard Mac System software. AFE is a utility that lets you look at the contents of a DOS disk and copy a DOS file to a Mac disk. But with AFE, Apple shows that it has a double standard for moving files. For Mac floppies, hard disks, and removables as well as DOS CD-ROMs, you can double-click on the disk icon to see its contents and click-and-drag to copy files from one volume to another. But to see the contents of DOS floppies and removables, you have to use the AFE utility, which has a less-thanintuitive interface similar to that of the Font/ DA Mover and which doesn't allow you to mount DOS disks. It hardly seems logical that neither System 6.x nor System 7.0 can mount a DOS disk on the desktop.

A Single Standard

Fortunately, you can make up for the Systems' shortcomings with one of two utilities, DOS Mounter, from Dayna Communications, or AccessPC, from Insignia Solutions, both of which cost less than \$100. These products let the Mac recognize the DOS file system on floppy disks and removable cartridges, so you can see and use these disks in the Finder. DOS Mounter, the first utility to eliminate the interface double standard, was followed by AccessPC, which expanded on the DOS Mounter idea and offers more functionality.

Popping one of these utilities (accessed through a control panel) into your System Folder fixes the operating system, but you're still out of luck if you don't have a SuperDrive. Fortunately, both DOS Mounter and AccessPC work with external DOS floppy drives from Apple, PLI, and Kennect. DOS Mounter also works with version 2.3 and later of the DaynaFile, Dayna's DOS floppy drive for the Mac.

DOS Mounter and AccessPC also work with various DOS-formatted removable-media devices, such as Bernoulli, SyQuest, and erasable optical (also known as magneto-optical) drives. If your removable cartridge has DOS partitions, AccessPC and DOS Mounter can mount each partition as a separate desktop volume.

Unfortunately, some removable-media drives come with drivers that don't follow

PLATFORMS

Apple's specifications for software drivers. These drivers don't work with DOS Mounter or AccessPC, because they don't tell the system (including installed INITs) that a disk has been inserted when a non-Mac disk is in the drive. The result is that your DOS SyQuest cartridge can't mount.

Therefore, you must use a driver that follows Apple's specs. Many such drivers are available; the manufacturer of your removable-media drive may be able to recommend a good one. In addition, both Dayna and Insignia offer a driver that works. Dayna will send you a free driver if the software driver for your SyQuest or erasable optical drive has problems with DOS Mounter; AccessPC comes with a universal driver called Multi-Driver (see Figure 1). Multi-Driver uses disk-caching techniques to speed SyQuest and erasableoptical performance, but to use this option, you have to format the media with Media Formatter, another utility that comes with AccessPC. If you decide to use Multi-Driver or Dayna's driver, proceed with caution, because the software driver you use is a big factor in determining the performance of a storage device - the replacement driver may not be as fast as the driver you already have.

One of AccessPC's biggest assets is that it can mount the "hard-disk drive" file of SoftPC (Insignia's DOS-emulation package, which lets you run DOS programs on your Mac) as if it were a real hard drive connected to your Mac. SoftPC uses a file that acts as a PC drive C:, or the place you usually store your DOS files and directories. Normally, the only way to see this file's contents is by running SoftPC and using the DOS command DIR. However, by using AccessPC to mount the SoftPC hard-disk-drive file on the desktop, you get a volume that you can drag files into and out of.

What's in a Name?

You may want to do more than just look at the contents of a DOS disk or copy files to your Mac disk. If you need to copy Mac files to the DOS disk or actually use the DOS files on your Mac, you'll first have to modify the files. If they're already in a format Mac applications can read (such as WKS, from Lotus 1-2-3), the modifications will be small and can be done automatically by both DOS Mounter and AccessPC. If your DOS files are unintelligible to Mac applications, you'll need a file-translation program, such as MacLinkPlus/Translators, from DataViz (see review, July '91,

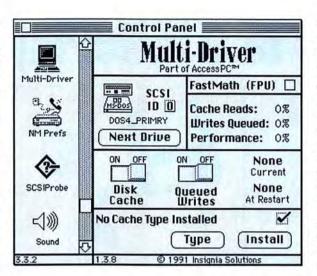


Figure 1: AccessPC and DOS Mounter work with DOSformatted removable-media drives. but you can't mount the removable cartridge if the device's software driver doesn't follow Apple's specs. To get around this. AccessPC includes the Multi-Driver control panel, which acts as a replacement driver for your SyQuest or erasable optical cartridge.

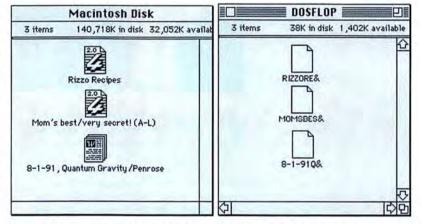


Figure 2: Because DOS and Mac files are named differently, DOS Mounter and AccessPC keep two filenames for each file created on a DOS disk. If the Save Mac Info to Disk option is turned off, AccessPC (shown here) always displays the DOS name, even if the DOS disk is in a Mac. The Mac files (left) were copied to a DOS disk, which now shows their new names.

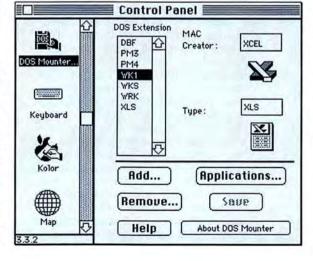


Figure 3: Both DOS
Mounter and
AccessPC let you map
DOS filename
extensions to Mac
Type and Creator
codes, so when you
copy DOS files to your
Mac disk, you can
double-click on them
and open them in a
specific application.

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PLATFORMS

page 78), or LapLink Mac III, from Traveling Software (see review, September '90, page 42).

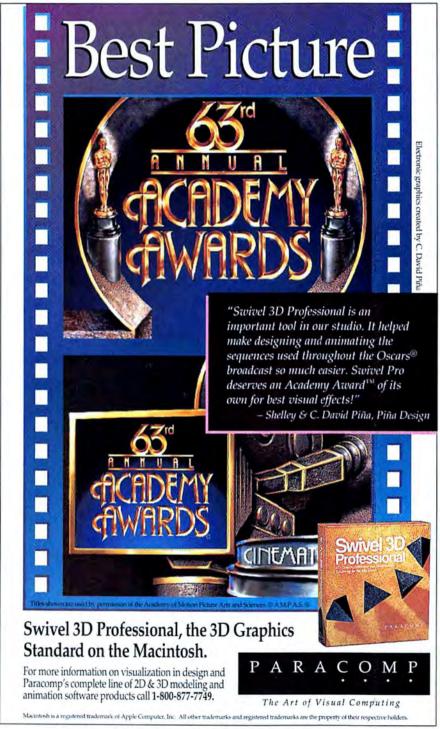
Part of the formatting problem is because DOS and Mac files are named differently, DOS filenames are limited to eight characters before a period, followed by a three-character extension. DOS filenames can't have spaces, asterisks, or slashes the way Mac names can. DOS Mounter and AccessPC take care of this problem by keeping two filenames for a file created on a DOS disk (although despite what AccessPC's manual says, this doesn't always work). For example, the Mac filename Rizzo Recipes becomes RIZZORE& on the PC, where the ampersand lets you know that the name has been altered. A second file with a similar name, such as Rizzo Recipes/Italian, becomes RIZZORE1. DOS Mounter shows you the Mac name when the disk is mounted on a Mac and the DOS name when the disk is mounted on a PC. AccessPC works the same way unless the Save Mac Info to Disk option is turned off, in which case it always displays the DOS name, even if the DOS disk is in a Mac (see Figure 2).

DOS Mounter and AccessPC store both the Mac and the DOS filenames on the DOS disk itself. AccessPC gives you the choice of turning this disk storage of filenames off with its Save Mac Info to Disk feature. If you do turn it off, AccessPC figures out the filenames on the fly whenever the disk is opened.

If you need to use DOS files on your Mac, the three-character extension of a DOS filename can be translated into the information that Mac applications need. Mac files don't have extensions, but they do have two invisible tags called Creator and Type, each of which is designated by a four-letter code. When you double-click on a DOS file, you get the familiar "Application Busy or Missing" message, because no Creator is identified. The Creator code (XCEL for Microsoft Excel, for example) designates the application that opens when you double-click on the file. The Type code designates the format of the file. This can be a generic standard format such as TEXT, PICT, or WKS or an application-specific format such as WDBN, for Word 4.0. Applications have the Type code APPL.

When you copy DOS disks to the Mac, both DOS Mounter and AccessPC automatically add a Creator and Type to a file, based on its DOS filename extension. This is called extension mapping, and you set this up in an AccessPC or DOS Mounter control panel (see Figure 3). You can set up extension mapping so that all DOS files ending in .DOC become double-clickable Word files or all Lotus .WK1 files open in WingZ when you double-click on their icons. If you need to change the Creator or Type after you've copied a file to the Mac, you'll need to use ResEdit or a utility such as DiskTop or DiskTools.

Using extension mapping doesn't guarantee that your Mac applications will be



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able to read DOS files. You still may need a file translator - such as DataViz's MacLinkPlus/Translators or Traveling Software's LapLink Mac III — if the DOS file contains formatting codes your Mac application doesn't understand. This formatting appears as random gibberish when the DOS file is opened with a Mac application. A file translator gets rid of the gibberish by translating the formatting code to code the Mac understands.

AccessPC and DOS Mounter take about the same length of time to mount disks. On a IIci with the disk-cache control panel turned on, both utilities took about 8 seconds to mount a DOS disk containing 41 files (totaling 676K) the first time and about 4 seconds each time after that. DOS Mounter slows down if you turn off the cache. AccessPC's speed improves if you turn off Save Mac Info to Disk - it took slightly less than 4 seconds to mount a floppy disk the first time, as opposed to 8 seconds with this option turned on.

The Bottom Line

Overall, AccessPC is the better DOSdisk-mounter utility. It works great in combination with Insignia's DOS-emulation package, SoftPC. AccessPC is also faster than DOS Mounter if the Save Mac Info to Disk option is turned off. However, unless you use SoftPC on a regular basis,

AccessPC

Comments: Mounts SoftPC harddisk-drive files and is faster than DOS Mounter.

Published by: Insignia Solutions, 526 Clyde Avenue, Mountain View, CA 94043; (800) 848-7677 or (415) 694-7600.

Version: 1.1. List Price: \$99.

DOS Mounter

tttt

Comments: The original DOS-disk mounter has improved with age: works with the DaynaFile.

Published by: Dayna Communications, 50 S. Main Street, Fifth Floor, Salt Lake City, UT 84144;

(801) 531-0600. Version: 2.03. List Price: \$89.

it's probably not worth switching to AccessPC if you already have DOS Mounter (which is bundled with the DaynaFile and MacLinkPlus/Translators) because both basically do the same thing and AccessPC costs slightly more. Either

way, it's time to end the double standard and mount your DOS disks.

MacUser's technical editor John Rizzo has written more than 120 articles on Mac-to-PC connectivity and other issues.

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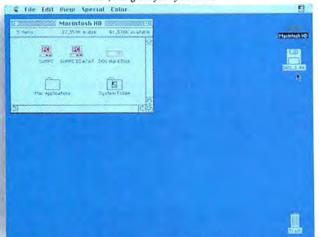
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The floppy disk icon is actually an MS-DOS disk, brought to you by AccessPC.*



Shown: Lotus* 1-2-3* release 2.2, running on SoftPC.*



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Mystery Lesson

A new crop of system-management tools makes solving network problems faster and easier.

By Kurt VanderSluis



n a recent troubleshooting adventure, a client asked me to determine why 3 Macs that were part of a 50-Mac network were crashing intermittently. I had recently received three new system-management tools—GraceLAN, Network Super Visor, and Status•Mac—all of which can gather and present a list of the INITs, applications, system configurations, and SCSI devices being used by each Mac on a network. They seemed like the right tools for the job, so I decided to give one of them a real-world workout.

There are many reasons why a Mac can crash, but one common problem is a memoryallocation conflict among INITs. Walking through my client's office, I noticed that the people on the network were using lots of INITs, some of them very old. I saw what appeared to be Pyro! 1.0 (the current version is 4.01) and thought I heard a Talking Moose. Although there are 50 Macs in this office, there is no full-time network administrator or any policy on software piracy or paying for shareware. Consequently, the Macs had a large variety of software, legal and illegal. All the machines did have a commercial antiviral utility installed, so I didn't immediately suspect a virus as the source of the crashes.

I chose Technology Works' GraceLAN as my troubleshooting tool and installed its Responder INIT on the three Macs that were experiencing the crashes problem and on five randomly selected noncrashers. I then placed

the GraceLAN application on another Mac and used it to scan the eight Macs in the test group to get their configuration information. In about 20 minutes, I had all the data I needed. In fact, I had a tremendous amount of information to sort through - unfortunately, GraceLAN has no database for compiling the resulting information. (Both Status Mac and Network SuperVisor do have databases for organizing network data.) GraceLAN can display the data on-screen or print it, however, so I printed the detailed information for each of the eight Macs and laid everything out on a large desktop, hoping that my human-based pattern recognition and deductive subroutines would solve the mystery.

The question that I wanted to answer was, what's special about the system configuration of the three crashers that makes them different from the noncrashers? Considering how system-management packages are marketed (and priced), you might get the impression that all you have to do is rev up GraceLAN, Network SuperVisor, or Status•Mac (or another system-management tool such as TrafficWatch II, NetAtlas, or TalkManage), and a few minutes later the program will give you The Answer. Wrong. System-management tools merely gather and display information. You, the network manager, are still responsible for providing the answers.

In my efforts to ferret out the information, I had one clue: The Macs usually crashed when

TROUBLE SHOTS

people were away from their desks, not while they were using the machines. One of the users (I love this kind of user) even had a crash log he had been keeping since the first crash. It listed the time, date, and conditions for each of the crashes. Six of his seven crashes happened while he was away from his desk. This kind of scenario usually indicates that a screen saver is involved.

Looking at the list of INITs, I saw that the commercial screen saver Pyro! 2.0 was loaded on all three of the machines that were crashing. It was also loaded on two of the five machines that were not crashing. Clearly, Pyro! 2.0 alone was not sufficient to cause the crashes. I looked to see what else the troubled Macs had in common and found that all three had two shareware INITs — SuperClock (which puts a clock onto the menu bar) and HierDA (which creates hierarchical pulldown menus) — loaded as well. (HierDA was an older shareware version, not the current commercial version, Now Menus, that's included with Now Utilities.)

At this point, I factored in some previous experience: I'd had troubles with HierDA a couple of years ago. Back then, HierDA conflicted with MORE 2.0 and I had to remove it. Among the eight machines, all three crashers had HierDA but so did three of the noncrashers. However, only the crashers had both Pyro! 2.0 and HierDA. With this combination as the possible culprit, I called Fifth Generation Software (the maker of Pyro!) to ask if there were any known conflicts between Pyro! 2.0 and HierDA. The techsupport person said that the company didn't have lists of known conflicts with Pyro!, and even if it did, the list certainly wouldn't extend back to the 2.0 version.

Because no one could tell me otherwise, I decided that the crashes were being caused by a conflict between HierDA and Pyro! 2.0, but the evidence felt inconclusive to me. I even searched outside the test group, but no other Mac had this combination of INITs. We removed HierDA from the machines, and in the weeks since this episode, those three Macs have not crashed again. But is this a success story?

My uneasiness stems from the fact that Idon't know whether I actually solved the problem. For example, all three of the crashing Macs were also using Super-Clock. Perhaps it was the combination of Pyro!, SuperClock, and HierDA that caused the Macs to crash. Or maybe each Mac had a different problem and my investigative technique of looking for commonalities was misguided from the start. This lack of conclusion troubles me—but not my client, who is happy to be rid of the crashing problem.

What are the weak points of this investigation that prevented a concrete solution? For starters, I used only eight Macs in my test group, because I wanted to reduce the time I had to spend sifting through the data. I was prepared to add

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You might think a system-management package can give you The Answer, Wrong, These tools merely gather and display information.

more Macs if the situation warranted, but ideally. I should have used the entire network as my test group.

I could have included the entire network (without being buried under the resulting pile of data) if GraceLAN or its competitors had been capable of performing all the pattern matching for me that is, if the program could have automatically sifted through the data and found the common elements. This is not a trivial computing problem when you have an undirected search algorithm (you don't know what you're looking for), and it's compounded by the fact that you may have "fuzzy" information - that is, some of the information you think is correct may actually be wrong. For example, one or more of the Macs I classified as "noncrashing" might actually have been crashing but the user was not reporting it. Unfortunately, the artificial intelligence required for pattern matching and evaluating data accuracy is not built in to any of the programs - yet.

Although system-management tools can't automatically search for patterns, they are proficient (to varying degrees) at finding an already defined combination. For example, if you think that a crashing problem is caused by the combination of HierDA and Pyro! 2.0, Status Mac will let you perform a Boolean search to locate the Macs with that combination.

All these system-management tools are relatively new and will probably be upgraded by the time you read this. We're still learning how to use them, and the developers are still inventing what they do. Although these tools can't provide any intelligence yet, they are useful for gathering and displaying information, and you should consider them your troubleshooting toolbox. Just remember that the answers still have to come from you.

Kurt VanderSluis is president of The Network Group, a training and consulting firm in Seattle.

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How to Get On-Line Support

Stuck on hold every time you call tech support? Going on-line with your problems can save you time and money.

By Owen W. Linzmayer

hen you run up against a brick wall while working on your Mac, do you instinctively pick up the phone and dial tech support? If so, you probably know the frustration of constant busy signals and long-distance holding patterns. But if you have a modem, there is a way of getting tech support without the hassles.

With a modem and a telecommunications program (such as MicroPhone or White Knight), you can log on to national on-line information services such as America Online and Compu-Serve anytime. Most major software publishers and hardware manufacturers have employees who roam the electronic information services answering questions, solving problems, and

keeping in touch with customers. This support is usually free (except for normal on-line charges) and complements the companies' telephone technical help.

The benefits of on-line support include access to top-notch technical personnel, prompt and thorough replies, updates and patches for products you own, and — because most on-line services have local access numbers — some savings in long-distance telephone calls.

If you'd like to try on-line support but don't know where to find it, see Table 1, which contains a directory of some of the major companies that use telecom services. (If the manufacturer of a product you use

On-Line Information Services



America Online

Since its premiere in 1989, America Online (AOL) has quickly become a major consumer telecom service for Mac

and Apple II users. Much like CompuServe and GEnie, AOL offers computing-support bulletin boards; special-interest forums; huge download libraries; interactive conferences; and multiplayer, on-line games.

AOL's graphical interface helps Mac users feel right at home. In contrast to users of the larger, older information services, who must enter terse instructions via a command-line interface, AOL users simply point and click on folders, filenames, and icons.

Despite AOL's friendly interface, you can't easily automate the process of logging on and off after gathering information as you can with CompuServe. Fortunately, the low monthly fee of \$5.95 covers one free hour of connect time. Additional use is charged at \$5 per hour evenings and weekends and at \$10 per hour weekdays. Initial sign-up is free.

America Online, 8619 Westwood Center Drive, Vienna, VA 22182; (800) 227-6364 or (703) 448-8700.



AppleLink

AppleLink, maintained by Apple Computer, provides access to information about Apple and third-party pro-

grams and products. Subscribers can read the latest press releases, look up product prices and specifications, send and receive E-mail and disk files, receive answers to technical questions, and learn about software updates. Virtually every Mac developer (7,200 at last count) has an AppleLink account.

The \$70 AppleLink Startup Kit is available to Apple vendors; suppliers; developers; resellers; user groups; consultants; and select business, education, and government customers. Connect time costs \$12 per hour, with a \$12 monthly minimum.

Incidentally, AppleLink has a gateway that lets you exchange messages via Internet, an international network consisting mainly of UNIX-based computers in universities and large corporations. Internet users should direct E-mail to the appropriate AppleLink address and add @applelink.apple.com to the address. If you'd like to know more about Internet, download "The Hitchhiker's Guide to the Internet" (filename HHIKER.SEA) from MacUser's on-line service Zmac (see the CompuServe section). This detailed description of Internet and its features is in Library 7 (Reference) of the Download & Support Forum.

AppleLink, 20525 Mariani Avenue, M.S.: 47B, Cupertino, CA 95014; (408) 974-3309.

CompuServe

CompuServe (CIS) is geared toward the consumer market. It consists of special-interest forums where users can ex-

change messages on subjects from computers to cooking, politics to personal finance. Most forums have related libraries containing text documents and computer files you can download for the price of the connect time.

CompuServe currently boasts 750,000 subscribers, and the various Mac forums are extremely active. *MacUser* and *MacWeek* chose CIS as the home of Zmac, their own online service, because it's where the most Mac fanatics hang out.

After buying a sign-up kit for \$29.95, users can access CompuServe from any kind of computer by using a basic telecom package. The cost of CompuServe connect time depends on the speed of your modem: \$6 per hour at 300 bps (bits per second), \$12.50 at 1,200 or 2,400 bps, and \$22.50 at 9.600 bps. CompuServe offers two Mac applications (CIM and Navigator) designed to overcome the system's antiquated teletypewriter interface and minimize on-line connect charges (both programs were reviewed in the March '91 issue, page 62).

CIS and MCI Mail share a gateway, so subscribers can exchange E-mail. When creating a new message on CompuServe for an MCI Mail address, at the To prompt, enter >MCIMAIL and a space, and then the recipient's MCI Mail

CompuServe Information Services, P.O. Box 20212, Columbus, OH 43220; (800) 848-8199 or (614) 457-0802. isn't listed, call its tech support to find out if the company offers on-line support.) The personnel who monitor on-line accounts usually reply to inquiries promptly or direct your comments to the appropriate employee within the company.

Some companies have more than one on-line address; for example, they may maintain a CompuServe E-mail address (designated by a number) as well as a public-bulletin-board address (designated by the GO command). Although you can send private E-mail directly to the accounts, most companies prefer that you post your message in the public-bulletin-board areas (called special-interest groups,

roundtables, or forums) so that other people on-line can read your message and the company's reply. You'll benefit from the unsolicited responses offered by knowledgeable users — it's not uncommon to post a question at night and return the next morning to find half a dozen detailed replies.

If you don't yet subscribe to any of the major on-line services listed in Table 1, check out the "On-Line Information Services" sidebar for brief descriptions of each service, along with information on sign-up fees and connect charges. There's a lot of overlap among the various services, so unless you're an insatiable information

junkie, you probably need to sign up for only one or two services.

By the way, a growing number of companies operate an in-house bulletin-board system (BBS) as well. Sometimes limited to registered users, these systems are based at the company's headquarters and can be accessed with standard telecom software. If you have difficulty connecting, call the company's technical-support hot line for assistance.

San Francisco-based free-lance writer Owen W. Linzmayer's on-line accounts are OWEN INK (America Online), OWEN (AppleLink), and 72511,70 (CompuServe).

CEnie GEnie

(which is short for General Electric Information Services) is a consumer-oriented information service run by General Electric. Its 209,000 users pay a flat monthly subscription rate of just \$4.95, which includes unlimited, nonprime-time access to more than 100 products and services, including E-mail, but not most personal-computing bulletin boards. (Nonprime time is weekdays from 6 P.M. to 8 A.M., weekends, and holidays.) The rate for services not covered by the flat monthly fee, such as personal bulletin boards, is \$6 per hour during nonprime time and \$18 per hour during prime time. There is no sign-up fee for GEnie, and the first month of on-line usage is covered by a money-back guarantee, so if you're not satisfied, it's free,

Users can access GEnie from any kind of computer with a basic telecom package. The Mac version of Aladdin, an application that automates interaction with the service, is currently under development and should be available in late 1991.

General Electric Information Services, 401 N. Washington Street, Rockville, MD 20850; (800) 638-9636 or (301) 340-4000.

MCI

MCI Mail

MCI Mail is strictly an electronic-mail service; it has no special-

interest forums or download libraries. Users can access MCI Mail from any kind of computer by using a basic telecom package.

MCI charges a \$35 annual registration fee and bills users based on the character count of messages sent; there is no monthly minimum. E-mail consisting of 1 to 500 characters, 45¢; 501 to 2,500 characters, 75¢; 2,501 to 7,500 characters, \$1; and every additional 7,500 characters, \$1.

MCI and CompuServe share a gateway through which subscribers to each service can exchange E-mail. When creating a new message on MCI Mail for a CompuServe address, enter the recipient's name at the To prompt, followed by a space and the letters EMS (electronic mail system) in parentheses — for example, "Jane Doe (EMS)". Enter "CompuServe" at the EMS prompt that follows. At the MBX (mailbox) prompt, enter the recipient's CompuServe account number. Disregard the second MBX prompt, and create your message as usual. When you send the message, it will be transferred to CompuServe's E-mail system.

MCI Mail, 1111 19th Street N.W., Suite 500, Washington, DC 20036; (800) 444-6245 or (202) 833-8484.

MacUser's On-Line Support



Zmac

MacUser and Mac-WEEK offer their own brand of tech support on-line via Zmac, which

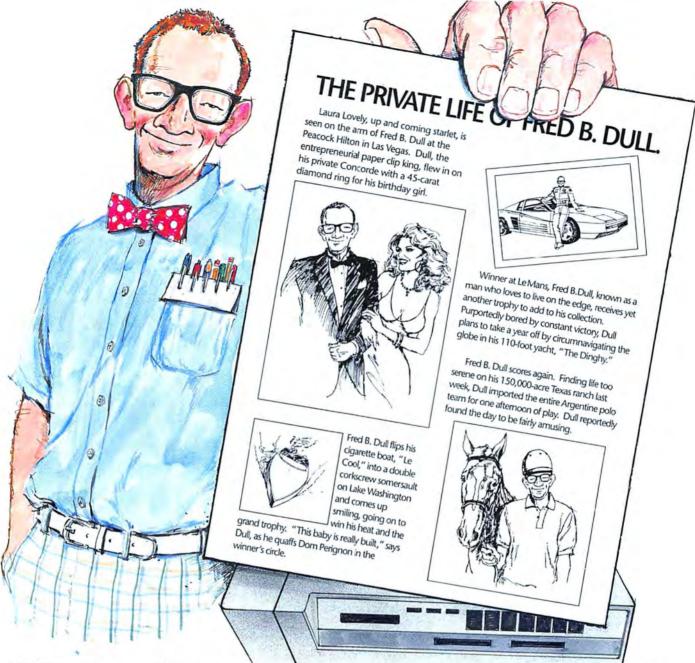
is part of CompuServe (see the "On-Line Information Services" sidebar for details on joining CompuServe). Once you're logged on to CIS, you can get to Zmac by typing GO ZMAC.

We can't promise that we'll be able to answer all your questions, but Zmac offers a couple of ways to get on-line help. One of them is through the MacUser Tips stack, a HyperCard database that contains the collected wisdom of Tip Sheet, Help Folder, and other articles that have appeared in the Power Tools section. You'll find this stack in the Download & Support Forum (look for the MUTIPS.SEA file in Library 7). And if the database can't help, try posting your question in the Download & Support Forum; someone's bound to have an answer for you.

- Ben Templin



	America Online	AppleLink	CompuServe	GEnie	MCI Mail	BBS
Aatrix Software	AATRIX	AATRIX	none	none	none	none
ACIUS	none	D4444	GO ACIUS 76207,1331	none	none	none
Adobe Systems	none	ADOBE.APPSU	GO ADOBE. APPSU	none	none	none
Advanced Software	CHERNISS	D2495	75510,56	none	none	none
Affinity Microsystems	AFFINITY	D0001	76344,1750	AFFINITY	AMS	none
After Hours	AHSOFTWARE	AFTERHOURS	73260,2551	none	none	none
Aladdin Systems	ALADDIN	ALADDIN	75016,325	ALADDINSYS	none	none
Aldus	none	none	GO ALDUS	none	none	none
Altsys	ALTSYS	D0590	76004,2071	none	ALTSYS	none
Ashton-Tate	none	none	GO ATAPP 76702,255	move 270;1	none	(213) 324-218
Beagle Bros.	BEAGLE LEE	D0086	none	B.BROS	none	(619) 558-61
Berkeley Systems	BRKLYSYSTM	D0346	GO MACBVEN 75300,1376	none	none	none
Bowers Development	SPECB	D1721	7073,3710	none	none	none
Brøderbund	BBUNDTECH	none	GO MACAVEN 76004,1530	none	none	none
CE Software	CESOFTWARE	CESOFTWARE	76136,2137	CE-SUPPORT	CESOFTWARE	none
ChipSoft	none	none	GO MACBVEN 75300,762	CHIPSOFT	none	(619) 453-52
Claris	none	CLARIS.TECH	GO MACAVEN 76004,1614	none	none	none
CMS Enhancements	none	D0483	none	none	none	(714) 222-66
CoStar	COSTAR2	COSTAR1	73130,467	none	none	none
Dantz Development	DANTZDEV	DANTZ	72477,1322	none	none	none
DayStar Digital	none	D2281	73777,2453	none	none	none
DeltaPoint	none	D0067	GO MACAVEN 76004,1522	none	none	none
Deneba	none	D0412	GO MACBVEN 76004,2154	DENEBA	none	none
Digital Vision	DIGVISION1	DIG.VISION	71521,3456	S.SARSFIELD	none	none
Dove Computer	DOVE1	DOVE.SUPPORT	72230,653	DOVECOMPUTER	none	none
Dubl-Click Software	DUBLCLICKS	DUBL.CLICK	72260,3720	DUBLCLICK	none	none
Eccentric Software	DGOLDSTEIN	none	73677,1537	none	none	none
Ehman	EHMAN1	EHMAN.INC	72541,26	none	none	none
Farallon Computing	FARALLON	FARALLON	75410,2702	FARALLON	FARALLON	none
Fifth Generation Systems	FIFTH	FIFTHGENSYS	GO MACAVEN 76004,2301	FIFTHGENSYS	452-9077	(504) 295-33
Frame Technology	none	FRAME.TECH	none	none	none	(408) 433-48-
GCC Technologies	GCC TECH	D0126	76004,2302	GCC.TECH	none	none
Global Village Communications	GLOBALVILL	GLOBALVILLAG	73547,214	none	none	none
ICOM Simulations	ICOM1	ICOM.TECH	76702,1604	none	none	none
Informix	none	WINGZ.JVR	none	INFORMIX	none	(913) 492-20
Inline Design	INLINE	INLINE	71131,1760	INLINE	INLINE	none
Jasik Designs	none	D1037	76004,2067	none	none	none
Kennect Technology	KENNECT	D2997	none	none	none	none



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POWER TOOLS TECHNIQUES

Table 4 - 6	and I down the own	a Charmon mand	- management
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	America Online	AppleLink	CompuServe	GEnie	MCI Mail	BBS
Kent*Marsh	KENTMARSH	KML.SUPPORT	73730,274	none	none	(713) 623-6328
Kiwi Software	KIWIS0FT	D0862	73207,1276	none	none	none
Letraset	none	none	none	none	none	(201) 845-5362
MacroMind	MACROMIND	D0128	none	none	none	none
Mainstay	none	D0397	GO MACAVEN	MAINSTAY	284-4985	none
			76004,1525			
Maxis	MAXIS	D4459	71435,276	MAXIS	MAXIS	none
MECA Software	none	D3493	76376,123	none	none	none
Microcom	MICROCOM	CARBONCOPY	none	none	none	(203) 798-396
Micron Technology	MTECHSPRT	MICRON	none	none	none	(208) 368-453
MicroNet Technology	MICRONET	D1656	76004,1611	none	none	none
Microseeds Publishing	MICROSEEDS	MICROSEEDS	GO MACBVEN	none	none	(813) 885-268
			76004,2100			
Microsoft	none	none	GO MICROSOFT	MS.MACAPPS	none	(206) 637-900
New Era	NEW ERA	NEW ERA	none	none	none	none
Novell	none	NOVELL.WC	GO NOVELL	none	none	none
Now Software	NOW	NOWSOFTWARE	71541,170	S.NOW	NOWSOFTWARE	none
Nuvotech	NTSUPPORT1	NUVOTECHHELP	72600,1561	none	none	none
Odesta	ODESTA	TECH, CONNECT	none	none	none	none
ON Technology	ON TECH	ON.SUPPORT	none	none	none	none
Optical Access International	none	OAI	72466,175	none	none	none
Optima Technology	none	D6224	76326,1677	none	none	(714) 476-062
Orchid Technology	ORCHID.TS	D1486	76467,1424	none	none	(415) 683-032
Paragon Concepts	none	none	GO MACAVEN	none	283-3053	none
			75300,1243			
Peachtree Software	GENOIS	PEACHTREE	73740,1627	none	none	none
Portfolio Systems	PORTFOLIO	DYNOTECH	71341,3076	none	none	none
Power Up! Software	none	SCHAFFER.S	76675,3021	none	none	none
Preferred Publishers	PPI	D0766	none	PREFERRED	none	none
Prometheus Products	PROMETHEAN	D6164	76004,527	PROMETHEUS	BCHRISTIANSEN	(503) 624-074
Quark	QUARKTECH	QUARKTECH	GO DTPFORUM 75140,1137	none	none	none
Radius	none	RADIUS.TECH	GO MACBVEN 76004,2155	none	none	none
RagTime USA	RAGTIMEUSA	RAGTIME	none	none	none	none
Salient Software	SALIENT	SALIENT	76174,2440	none	none	none
Shiva	none	SHIVA.TECH	72747,715	none	none	none
Silicon Beach Software	none	D0227	GO ALDUS 76702,707	none	SBS	none
Sitka	none	D0098	76004,2075	none	none	(415) 769-877
Softview	SOFTVIEW	SOFTVIEW	GO MACAVEN 76702,1174	SOFTVIEW	SOFTVIEW	none
Software Security	none	D2379	none	none	none	(203) 329-725
Software Ventures	MICROPHONE	D0025	76004,2161	SVCTECH	286-6859	(415) 849-191
Solutions	SOLUTIONS2	D0053	76174,2352	none	SOLUTIONSING	none
Spectrum HoloByte	SPHERE	SPHERE	76004,2144	HOLOBYTE	none	none
SuperMac Technology	SUPERMAC	SMT.TECH	GO MACBVEN 76004.2330	SUPERMACTECH	none	(408) 773-450



CHOOSE THE RIGHT TOOL FOR THE JOB.

Everyone knows that in order to do a job right, you need the right tool. For precision drawing and drafting, you need a powerful, easy-to-use program well-suited to the project at hand. Like MacDraft® or Dreams.® Each a serious, no-nonsense tool for architectural and engineering design & drafting, as well as technical illustration. Designed to respond quickly and accurately to the way you think and work.

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	America Online	AppleLink	CompuServe	GEnie	MCI Mail	BBS
Supra	none	none	76004,565	SUPRATECH	none	(503) 926-3607
Symantec	THINKSUPT	D0152	GO SYMANTEC 76666,2005	none	none	(408) 973-9598
Symmetry	none	D0031	none	SYMMETRY	none	none
T/Maker	none	TMAKER.DEV	GO MACBVEN 73170,3133	none	none	none
Tactic Software	JJBARTLETT	D6089	71511,3300	none	none	none
TGS Systems	PROGRAPHER	CDA0242	73300,3460	none	none	(902) 455-6616
Thunderware	THUNDRWARE	D0079	none	none	none	none
TimeWorks	PUBLISH IT	none	GO TIMEWORKS	none	none .	none
UserLand Software	none	EL.GRANDE	76244,120	none	358-0169	none
WordPerfect	none	none	GO WPSGB 73040,2571	WP.IBM	none	(801) 225-4414
Zedcor	ZEDCOR	D1083	none	none	none	none

"1989 Best Word Processor" MacUser U.K.

You might not think of using a word processor to reformat mainframe files but isn't it nice that Nisus® 3.0 can

Now, with the power of Nisus 3.0's built-in word processing language you can convert mainframe files, index every word in a 400 page book, or even compute a trigonometric function

Most people believe that converting mainframe data into a format that you can use with a Macintosh is no trivial task. Companies spend thousands of dollars on the problem only to run into dead ends. Imagine their surprise when these companies learn that in less than half an hour, Nisus 3.0 can do for them what hundreds of thousands of dollars spent on equipment can not.

The power of Nisus not only

lets you convert mainframe data, it lets you index every word in a document, and remove unwanted and nonessential words like "the, and, not, and of."

But the built-in word processing language isn't the only surprise in Nisus 3.0. It also has an integrated graphics capability that will let you do things that some layout programs can't such as rotate text, graphics, or even add arrows.

0025000G5001 50630D PANSOPHIC PANVALET 001 50860C WEST WESTI
001 51000K IBM DL/1 001
A & M RECORDS LOS ANGELES CA90028 2134480037C365200275
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0025000G300G101298130IBM 4341-UNK 8601M ODOS-VSE 21298069IBM
3350 01610298058IBM 3420 00813298100IBM 4245 002

LOS ANGELES

The sample above shows fixed length fields and fixed length records that are common in some mainframe files. That means you can not simply tell your conversion program to drop in tab or comma delimited spaces at the end of the text in each field. For most programs converting this would be complete chaos. And that's without eliminating the duplications and extracting just the information you want.

Nisus 3.0's word processing language makes short work out of the formatting, extracting, and elimination process. Note the results below, including the bold face and upper and lower case changes. We are not suggesting you buy Nisus only for its ability to convert mainframe files, but with this kind of power, imagine what else you can do.

A & M Records	1416 N LA Brea	Los Angeles	CA
A A Griffin Audio Eng	2145 W Central Ave	Springfield	MO
A B Chance Co	210 N Allen ST	Centraila	MO
A C Nielson Co	PO Box1297 30 S Main St	Fond Du Lac	WI

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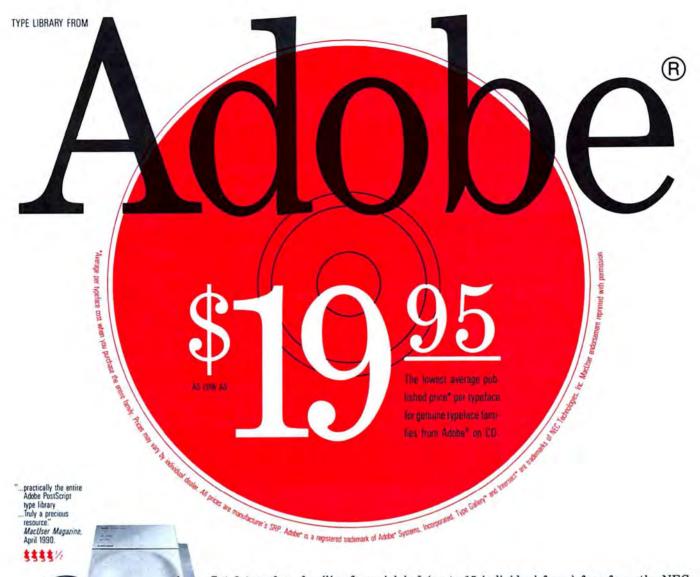
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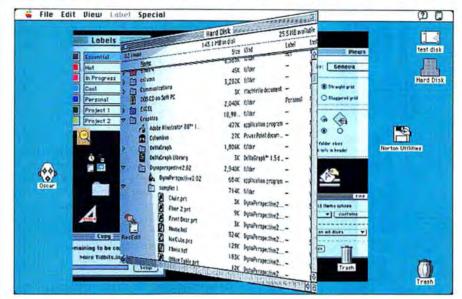
CDA Sales 1-800-926-5313 Educorp 1-800-843-9497 Mac Warehouse 1-800-255-6227 Mac Zone 1-800-258-0882

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System 7.0's Hidden Secrets

Here's a batch of hidden and undocumented tips for getting the most out of System 7.0.

By Bob LeVitus



ast month I presented the case for waiting a while before upgrading to System 7.0. No sooner had I written that column than I proceeded to ignore my own advice. I've been using various versions of System 7.0 since the beginning of the year, and I'm happy to report that it hasn't been at all bad: The beta software I've been using (I'm writing this before the official ship date) has been pretty stable, and I've had a chance to discover lots of new features and helpful shortcuts. Some of these are undocumented; others might be described in the manual, but they're not intuitively obvious and can take a little time to get used to.

Take the Trash, for example. Before System 7.0, when you launched a program, shut down, or restarted your Mac, the Trash was emptied without any warning. In System 7.0, however, the Trash works the way trash cans do in real life: When you throw something away, it stays in the trash until you empty it (in the case of System 7.0, you do so by using the Empty Trash command), even if you launch a program, shut down, or restart. This is pretty straightforward - and yes, I know it's in the manual — but I have to admit that a few days passed before I noticed that the Trash wasn't emptying. And then it took a few more days before I started remembering to take out the trash periodically.

In the spirit of the Trash that doesn't empty behind your back, I offer you the best of System 7.0's hidden secrets. You're bound to find your own as you start using the new System, so let me know what you come up with (you can reach me on Zmac's MacUser Forum or on CompuServe at 76004,2076). I'll report on any particularly good secrets in the coming months, and the winners will receive genuine all-cotton, "I Beat the System" T-shirts, so keep those cards and letters coming.

Finder Secrets

Background File Copying. One of my favorite System 7.0 features is that you can copy files in the background while you're working on something else. (Yeah, this is in the manual too, but I didn't pick up on it for weeks.) Just make sure you launch the application you want to work in before you begin copying the files, because you can't use the Finder while you're copying files but you can use any application that is already open. You may notice a slight degradation of performance — a twitchiness similar to that during background printing — but it's a small price to pay for the time you save when you have work to do.

Colorized Icons. If you're the creative type, you might enjoy editing or colorizing some of your icons. With earlier versions of System software, you had to use ResEdit or other complicated icon-editing software, but System 7.0 lets you edit or colorize icons, using nothing more complicated than a painting program. Here's how:

 Select an icon, and choose Get Info from the File menu (Command-I).

This used to be a Full-Page Ad.

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Compress files. Save disk space. Save modem and network transfer time. Enough said. Just Stufflt.™

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POWER TOOLS

BEATING THE SYSTEM

- In the Get Info window, click on the icon once to select and copy it.
- Open a new document in a painting program and paste the icon into the document.
- Modify the icon in any way you want, select it, and copy it.
- Return to the icon's Get Info window, and paste in the new icon. Presto — that file, folder, or disk now sports your redesigned icon.

Spaces at the Beginning of Filenames and Folder Names. Under System 6.x you can't begin a filename or folder name with a space, but under System 7.0 you can precede a name with as many spaces as you like. This is great, because names that begin with a space appear at the top of the list (in lists that are sorted alphabetically, a space is listed above letters and numbers). The Apple Menu Items folder works the same way: The more spaces you put before a file's name, the closer to the top of the Apple menu it appears.

Trash. We can't leave the Finder without mentioning the Trash again, so here are a couple more tips:

- The Trash icon stays wherever you put it, even after you restart or shut down. Move the Trash anywhere you like; it'll still be there next time you start up your Mac.
- 2. Usually you get a warning when you choose Empty Trash from the Special menu, but you can turn this warning off. To do so, select the Trash, choose Get Info from the File menu, and uncheck the "Warn before emptying" check box.

Alias Secrets

System 7.0's new aliases are great, but some of the ways to use them are not immediately obvious. Here are some of my favorites.

If you make an alias of a folder — any folder - and put it into the Startup Items folder in the System Folder, that folder opens automatically when you start your Mac (if you put an individual document or application into this folder, it launches on startup). I keep an alias of my Apple Menu Items folder in the Startup Items folder, so that it's always open on my desktop when I turn on my Mac. That gives me two ways to access items in my Apple menu - from the Apple menu itself or from the Apple Menu Items folder. (Speaking of which, don't forget that you can put anything, including a folder or an alias of a folder, into the Apple Menu Items folder. When you choose a folder's alias from the Apple menu, the folder pops open, which is particularly convenient if it is nested several folders deep.)

Aliases are also great if you're on a network. I love the "office-on-a-floppydisk" trick, which lets you use a floppy disk to access your Mac from any other Mac that's running System 7.0 on the network. Here's how:

- Create an alias of your hard disk and copy it to a floppy disk.
- In the Sharing Setup control panel, turn on File Sharing.
- 3. To make your hard disk available on the network, select it and choose Sharing from the Finder's File menu. In the Sharing dialog box, click on the "Share this item and its contents" box and set up the appropriate access privileges.

You can now mount your hard disk from any Mac on the network by merely inserting the floppy containing the alias of your hard disk and double-clicking on the alias

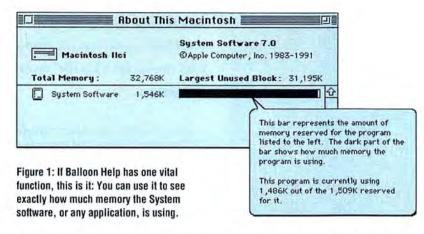
In a similar vein, if you frequently mount the same remote hard disk or server, make an alias of its icon. After that, you won't need to use the Chooser to mount it — just double-click on the alias. Or drop the alias into your Apple Menu Items folder, and choose it from the Apple menu.

Miscellaneous Secrets

Balloon Help. Before you decide you're too much of a power user to need Balloon Help, check out this tip. Make sure Balloon Help is turned on, and go to About This Macintosh on the Apple menu. When you point to the bar graphs that show how much memory is allocated for your open applications and system, a balloon pops up, telling you how much of that memory each application is actually using (see Figure 1).

TeachText. If you double-click on a text or PICT file and don't have the application that created that file, you no longer get the dreaded "Application busy or missing" dialog box. Instead, System 7.0 asks if you'd like to open the document by using TeachText.

TeachText also opens screen snapshots created with Command-Shift-3. These PICT files are automatically named Picture 1. Picture 2, and so on and placed on the desktop. If you double-click on one of these files, it opens in TeachText. You can even use TeachText's new selection rectangle to copy part of a picture and paste it somewhere else. If you want to open a PICT file in another application such as



Canvas or Photoshop, drag the screen dump's icon over the application's icon.

Hiding Applications. I always hated the fact that you couldn't hide an active application's windows when running MultiFinder under System 6.x. As a result, if you ran several applications at once, your screen became cluttered with windows that you weren't using. System 7.0's flexible hide-and-show feature fixes that nicely: You can hide or show any combination of windows, using the Application menu at the far right of your menu bar.

There are also several less obvious ways to use hide-and-show. If you hold down the Option key as you make a selection from the Application menu, the application you're in will be hidden when the application you've selected becomes active. If you Option-click on the desktop, the currently active application will be hidden and the Finder will become active. And if you Option-click on any window, the application you're working in will be hidden and the application for the window you Option-clicked will become active.

Changing Views. If you're viewing a folder on the desktop by one of the list views (Name, Size, Kind, Label, Date), you can change the view without having to go to the View menu. Simply click on the column header you want (Name, Size, Last Modified, and so on) to change to a different list view. This feature is so obvious that you wonder why it hasn't been in the System software for years (which, by the way, is how long third-party utilities such as DiskTop and DiskTools have had this feature).

Keyboard Shortcuts

System 7.0, and Finder 7 in particular, offers significantly more keyboard control than did earlier System software. If you

haven't done so already, choose Finder Shortcuts from the Balloon Help menu and take a look at the keyboard shortcuts documented there. They're excellent, and worth learning, but it seems that a few were left out. . . .

If you learn only one keyboard shortcut, make it this one: Command-Option-Escape - it forces the active program (or the Finder) to quit if it freezes. This won't save anything in the program that was active when you froze, and it doesn't always work, but when it does work, you can gracefully exit from the hung application and save any documents you might have open in other applications. Note: When you use this trick, be sure to restart your Mac as soon as you've saved all your work. The freeze indicates that something serious is wrong. If you continue to work without restarting, chances are that the problem will get worse and eventually cause another freeze or crash.

Here's another good one: You can eject or unmount a disk or volume by selecting its icon and typing Command-Y (yes, you can also use Put Away on the File menu, but this is the keyboard-shortcuts section).

Finally, here's one tip that is documented in the Finder Shortcuts window, but it's worth repeating: To disable all your extensions, including all control panels that contain INIT resources, hold down the Shift key when you start your Mac.

Stupid Mac Tricks

Just so we can finish with something sweet and non-nourishing, here are some concealed screens and pictures, all of which are interesting or amusing, none of which are useful. Both Apple and Claris have a long-standing tradition of hiding these screens inside their programs. For example, several versions of the Apple Installer





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POWER TOOLS REATING THE SYSTEM

Apple and Claris have a tradition of hiding pictures and messages inside their programs.

reveal a secret message when you type "ski" at the first screen. And someone at Claris stashed one of the best-known Easter eggs — the infamous adults-only Zebra Lady — in MacPaint 2.0. Here are some treasures to hunt for in System 7.0.

Open the Memory control panel, and hold down the Option key as you pull downthe pop-up hard-drive menu. Instead of seeing the names of hard drives attached to your Mac, you get a menu with the names of the virtual-memory design team, including humorous hierarchical credits.

Next, try holding down the Option key when you pull down the Apple menu. Choose About the Finder, and you'll see a pleasant mountain landscape. Look familiar? If you're a longtime Mac user, it should—it's a copy of the original About The Finder box, which appeared in Finder 1.0

Finally, the Puzzle that appears on the Apple menu conceals a double surprise. (Do the following on a copy of the Puzzle only.)

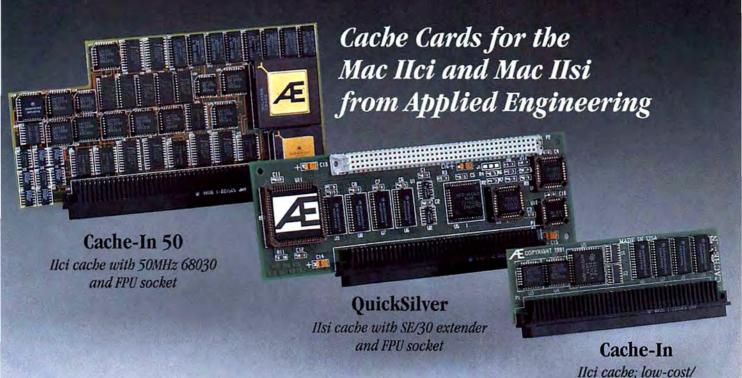
1. With the Puzzle open, choose Cut or Clear from the Edit menu. The System 7.0 picture disappears, and the Apple logo replaces it. If you choose Cut or Clear again, the Apple logo will be replaced by a number puzzle.

You can create your own puzzle by pasting an image into the puzzle from the Clipboard.

Thanks to all who've shared their System 7.0 experiences with me electronically via Zmac, AppleLink, and America Online and to the publishers and authors who let me peek at their System 7.0 books: Ventana Press and Craig Danuloff for *The System 7.0 Book*, available now at a bookstore near you, and BMUG and Alex Lau for *The Hitchhiker's Guide to System 7.0*, available from BMUG (you can contact the group at [415] 549-2684 [spells BMUG]). These books are packed with information you won't find in the Apple documentation, and I highly recommend both [52]

Bob Levitus has just finished new editions of his books *Dr. Macintosh* and *Stupid Mac Tricks* (from Addison-Wesley, Reading, Massachusetts, 1991).

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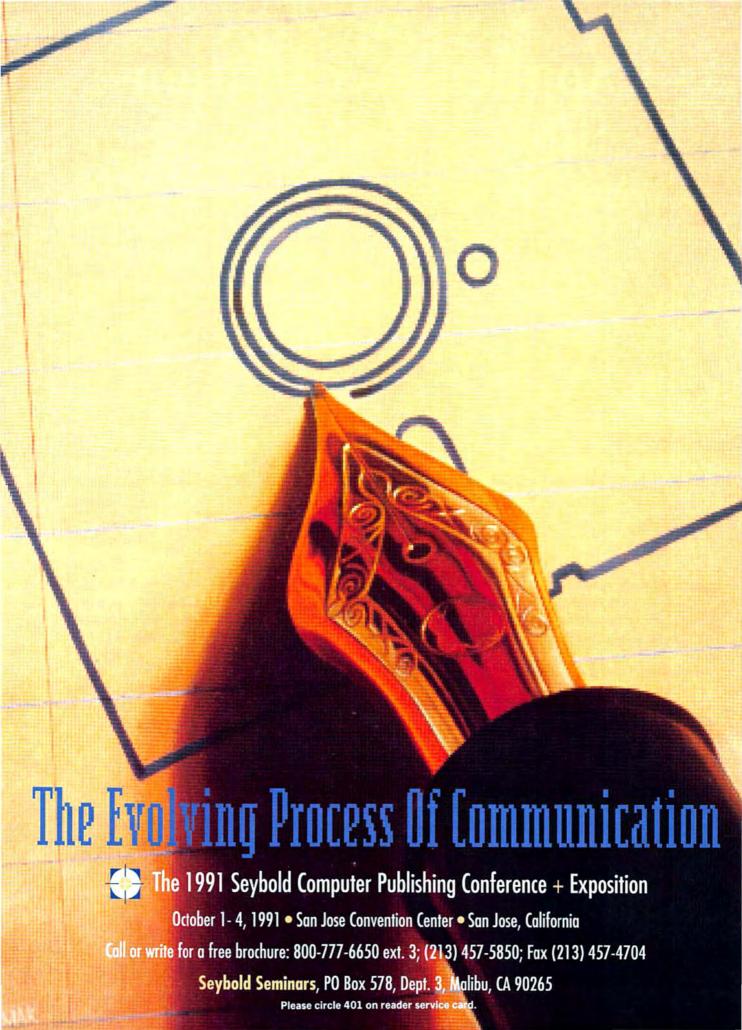
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The Perfect Spreadsheet

There's more to a great spreadsheet than just plugging in numbers. Here's how to plan, create, and troubleshoot the perfect spreadsheet.

By Thom Hogan

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oftware is getting more sophisticated. Each new release of a product seems to add dozens of features, refine old features, and make subtle changes to the program that affect the way you work.

But that's on a macro level. The commands you enter and the order in which you enter them might change when you move to new software, but the underlying philosophy of how you work shouldn't. The Microsoft Excel 3.0 release, for example, has more changes in it than I can adequately describe in the space of this column. Yet, having used it for a while, I'm struck by the thought that the more things change, the more they stay the same. Microsoft's ads try to get you to believe that the way you'll work with spreadsheets in the future is going to change because of Excel 3.0, but they're wrong.

Which brings me to the subject of this month's column: how to design effective and useful spreadsheets. I use Excel 3.0 in my examples, but what I have to say applies to any spreadsheet or graphing product. The rules and ideas I outline are pretty general, but I'll try to point out particular examples and how these rules might affect your everyday work.

The Planning Stage

Designing a good spreadsheet, also called a worksheet, is a great deal like designing a good program. Think about it: Programs are a series of instructions that solve a problem or do useful work, which is almost exactly what a

spreadsheet does too. Therefore, all the rules of programming pertain to the design of spreadsheets. This is especially true if you're designing a worksheet you'll use over and over, such as an expense or budget report. The more you're likely to use a worksheet, the more planning you need to do before you even launch the spreadsheet program.

There are as many ways to program as there are programmers, but in general, consider the following elements when starting a new worksheet:

Know what output you want to see. Work backward to determine what input and calculations are necessary to create that output (more on this later).

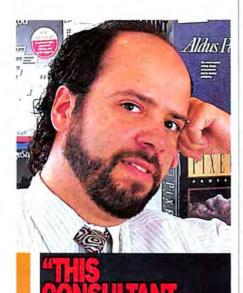
Look for reusable concepts. A modular worksheet is fast to create, and if you're really careful about how you create modules, you may be able to reuse them.

Keep it simple. The more complex you make the process, the more likely it will be to contain a mistake.

Design the worksheet as if you were creating it for others to fill in and use. Don't assume that everyone knows the same shortcuts and shorthand methods you do.

Refine your work before using it. The worst thing you can do is to make changes to your worksheet after you've started using it. You could make changes that will corrupt the worksheet's structure or the integrity of the calculations.

Make sure you know the spreadsheet



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5		Thingies	9,837	11,313	13,009	14,961	49,120
6		Widgits	3,504	4,030	4,634	5,329	17,497
7	In Between	Gedgets	950	1,093	1,256	1,445	4,744
8		Thingies	2,549	2,931	3,371	3,877	12,728
9		Widgits	5,209	5,990	6,889	7,922	26,010
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11		Thingies	3,532	4,062	4,671	5,372	17,637

Figure 1: Design your worksheet with the final output in mind. Work backward to determine what input and calculations are necessary to create that output, and make sure it conveys the message no matter who's using it. This example was designed to show a product's quarterly sales figures by region.

program before you begin. You can't create a great, usable worksheet by picking up a spreadsheet program and playing with it until you get things right. Playing with a product is fine, but relying on play to teach you everything you need to know about a product is risky business. You need to supplement your play with the following:

 Read the manual, including all those extra supplements that describe advanced features.

 Learn how to create and use macros. A good reusable macro saves you extra work.

•Study the functions the spreadsheet program provides. Functions are like predesigned macros — they can save you both effort and time.

•Study good worksheets to see how they were designed and how they work. Sometimes you find little gems that you can snip out of a worksheet and apply directly to your own. Microsoft and other spreadsheet-program publishers provide worksheet samples. You'll find others in books such as Charles W. Kyd's Microsoft Excel Business Sourcebook (Redmond, Washington: Microsoft Press, 1988).

Only Results Count

I once had a professor who paid rigorous attention to detail. He had us design a complete, auditable paperwork system for a small resort, complete with missing receipts, missing signatures on documents, addition errors by clerks, and situations such as "comp" rooms for special guests. As we tried to cope with hundreds of sheets of paper and thousands of details, the professor said over and over, "Don't forget that as your CEO, I only care about the *results*. All your attention to detail is worth nothing if I don't get results I can understand."

That's how it is with worksheet design
— it's the final output that counts. Is it
accurate? Can it be understood? Does it
summarize all the detailed information
necessary to present the full picture?

Map out how you want the output to look *before* you start typing into your spreadsheet. Once you know what output you need, you can figure out where the results will come from. Let's say, for example, that you need quarterly sales figures for a product line by region. Your final printout might look something like that in Figure 1. Simple and effective, this clearly summarizes the results you want to present.

Keep 'Em Separate

Here's the rule that separates the real spreadsheet programmers from the wannabes: Keep assumptions, input, calculations, and output separate. Why? Well, consider this. What happens if you need the same results, but the input keeps changing? Or the boss disagrees with your optimistic assumption that business will pick up by 231 percent next quarter? Or you find that one of your calculations is incorrect? Where do you go to fix these things if you've woven all the elements together into a mishmash of numbers?

Many people manage to do a decent job of separating input and output, mainly because they end up discovering that it's easier if all the input goes in one place (scrolling around a big worksheet looking for things that need to be entered is a waste of time, and you're almost guaranteed to miss something crucial). But assumptions are often woven into a worksheet just about anywhere, without regard for how they might need to be changed later.

For example, let's say that you're trying to project next year's monthly sales from last year's. Your goal is to do about 20percent better next year, so you end up with a row of calculations like this: A1*.20, B1*.20, C1*.20, D1*.20, and so on for 12 months.

This looks like a reasonable way to deal with the problem, but it isn't. Finding the underlying assumption used to calculate each cell value later will be time-consuming, and changing it will require the same amount of work all over again. Instead, create a section of the worksheet for assumptions. Create two cells, one containing a label that says "Projected Sales Increase (in percent)" and the other containing the .20 (20 percent) increase you anticipate. Your row of sales figures now uses the value of this cell instead of the fixed .20 you entered previously. That way, you can raise or lower your growth estimates (or make them negative!) simply by entering one number.

Here is some basic advice to consider:

 Separate assumptions from data and calculations so that the assumptions are clearly defined and easy to change.

•Separate input from the rest of the worksheet so that a user can go to one place to enter all the information needed to compile the results.

 Keep calculations separate from assumptions, data, and output; otherwise it's difficult to check their integrity.

 Use modular worksheets, which make maintenance, testing, and modification chores easier.

Check It Out

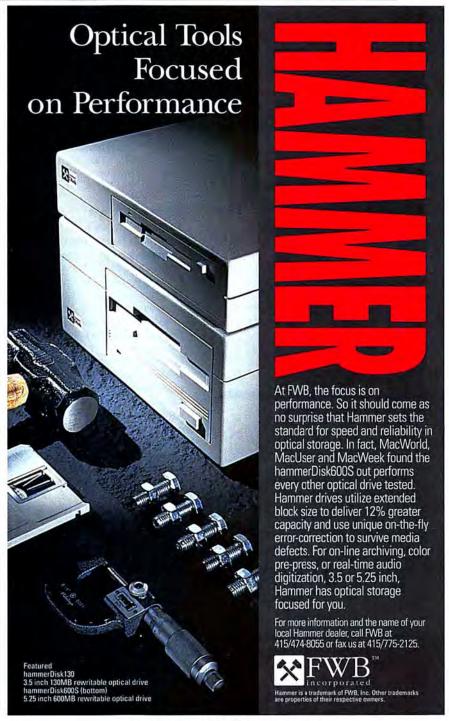
It's vital to build cross-checking in to your work and to make sure that nothing invalidates those cross-checks. What exactly is a cross-check? Let's say that you have monthly figures across the columns and several expense items down the rows. You want a total of monthly expenses and a total yearly expense value. So, spreadsheet whiz that you are, you use the SUM function to quickly add the values in each column and put a number at the bottom of each column. You may even sum across the months for each expense item and then sum the yearly expenses to create one grand total. So far, so good.

But if you don't put in a cross-check to validate that grand total, you're asking for trouble. To create the grand total, you used only one set of figures — either the expenses sums or the monthly sums. You should have used both. I generally put a second cell immediately to the right of grand-total values that calculates the sum a second way. If the numbers are different,

then I know that one of my subtotal calculations is wrong and I can immediately start looking for the error. If a sum can be calculated in more than one way, use that second calculation as a cross-check.

But you're still not quite there. Usually I see worksheets with the sum butted right

up against the row or column of figures it summarizes. What happens if you have to add a new row or column? If you do it within the block of cells, you'll probably be OK (assuming you used a range calculation — as in SUM (A1:A32) — inserting a new row anywhere between rows



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AD CLOSE: Wednesday July 24, 1991

POWER TOOLS THE EXPERT'S EDGE

The more you're likely to use a worksheet, the more planning you need to do before you even launch the spreadsheet program.

I and 32 updates the range calculation automatically inevery spreadsheet). But if you insert the new row or column anywhere else, you may be in trouble. Thus, when I build a block with summary calculations, I like to leave one or more empty rows or columns at the end of the block and include them in the sum calculation. Cross-checking helps verify that the inserted row or column is being handled correctly.

Check It Again

It's surprising how many people believe that spreadsheet programs are perfect. They put calculations throughout their worksheets and never bother to check any of them manually. The truth of it is that spreadsheet programs are *almost* perfect: You should get exactly what you expect when you use one to calculate a value. The problem is a human one. *You* aren't always perfect.

Let's say that you've got a worksheet that calculates a whole bunch of state-tax values. Because you're dealing with dollars and cents, you ask the spreadsheet program to round each value to two places after the decimal point. However, if you also have a calculation that sums all these rounded values, you're going to be in for a surprise: The spreadsheet program will use the actual values in the summation but will display rounded values, so the sum may not exactly match the numbers being summed! Had you checked your work with a calculator, you might have uncovered this problem. In this example, we're dealing with only a few cents, but this sort of problem has a way of sneaking into important work that deals with significant values. Any time you instruct a spreadsheet program to round the displayed values or limit the number of digits shown, you need to take extra care to check its work. And sometimes you just plain make mistakes, such as assuming that you included something in a SUM function when you didn't.

You should have to check a worksheet

manually only once, but make sure you do it with realistic values. I often put annotations at the top of worksheets in progress that say "unchecked" so that I know that I shouldn't start using them yet.

Be Organized

You should try not to have calculations that skip around within a worksheet. You can usually tell if a worksheet is well designed simply by viewing the formulas used. If you see calculation ranges such as SUM (A1: A32), then you're looking at a worksheet that was carefully considered before it was distributed. However, if you see formulas that look like this: SUM ((A1:A12)+(A15)+(A17:A32)). then the chances are that the person who designed it wasn't thinking in logical groupings. Is there really a valid reason why the summation skips cells A13, A14, and A16? Do those cells even relate to the other things in that column?

This is not to say that everything has to be perfectly arranged in blocks, but it sure helps if the majority of your work is well organized. Think about it for a second. You probably wouldn't trust a worksheet that had the months of the year arranged across the top of a spreadsheet like this: March, January, September, November, and so on. If you've got formulas that jump around as much as this goofy calendar, you're probably making the chore of programming your worksheet more difficult than it has to be. And you're certainly going to have a rough time building cross-checks and isolating input from output.

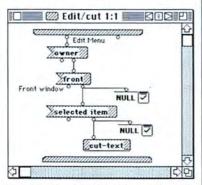
Keep Reading

I've described some simple rules that can help focus your mind as you begin to create a worksheet. If you'd like to know more, check out these books: Ledin and Ledin's The Programmer's Book of Rules (New York: Van Nostrand Reinhold, 1979) has nothing to do with spreadsheets, but it is an excellent introduction to organizing your thoughts and ideas and putting them into action. Nevison's The Elements of Spreadsheet Design (New York: Brady, 1987) goes into much more depth than I can cover here. Take a quick browse through your local library or bookstore, and you'll find dozens more books that will help you make great worksheets.

Thom Hogan is software evangelist at GO Corp. He hopes to reprint this column in *PenUser* in the near tuture.



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POWER TOOLS TIP SHEET



Do you have an undocumented Macintosh tip you're willing to share? MacUser pays \$25 for every tip used, and the Tip of the Month earns \$100.

You can also contribute tips electronically via Zmac, the on-line service for Mac-User. Send them to Gregory Wassonat 72511,36. Be sure to include your full name and mailing address along with the text of the tip.

Compiled by Gregory Wasson

Excel

Pressing the Command key while selecting cells is the usual way to make multiple noncontiguous selections in Excel. However, this can be a nuisance (not to mention a strain on your finger!) if you have many items to select. Instead, simply press Shift-F8 once, and Excel goes into the Add mode, letting you click or click and drag anywhere to add to your selection. Pressing F8 once takes you into the Extend mode and lets you make contiguous selections without having to hold down the Shift key.

Tod E. Gentille Redondo Beach, CA

PageMaker 3.0 and 4.0

Here's a fast way to realign the zero point on the grid to its default position at the upper left of nonfacing pages and the upper center of facing pages: Choose Page Setup from the File menu, and click on OK without entering any changes in the dialog box. The zero point instantly resets to its default.

Bill Planey Fort Worth, TX

QuarkXPress 3.0

Here's a tip that can revolutionize how you zoom in on parts of a document for better viewing: Select the item tool, and move the cursor to the area of the document you want to fill the screen. With the mouse button down, press Control-Option-Command and draw a box around the area. When you release the mouse, the boxed area will enlarge as needed and will be centered on your screen.

Kurt Holdorf Littleton, CO

Macs and Cats

Our cat, Cairo, has chewed up every cable connected to my Mac Ilex, monitor, laser printer, modem, and surge protector as well as all my power cords. After emerging from under the desk, Cairo would often have a seizure (we think he was giving himself electroshock therapy).

I solved this problem by buying 20 feet of flexible plastic tubing about 1.5 inches in diameter. I cut the tubing to the correct lengths for each cable and fished the cables through each one. The diameter of the tubing was large

Tip of the Month

Word 4.0

Word's ruler lets you know precisely where you are horizontally on the page, but you may want to see the exact position of text and graphics vertically too. You can create a vertical ruler on any page by inserting a narrow one-column table on the left side of any page (see Figure A). Here's how to create an 11-inch ruler with .25-inch increments:

1. In your open document, choose Page View (Command-B) and enter a Return at the top of the page on which you want the ruler to appear. Select the new first line. Open Word's ruler (Command-R), and click on the flush-right, single-spaced, and paragraph-spacing icons.

 From the Document menu, choose the Insert Table command. Specify a one-column 44-row table with columns that are .22-inch wide. Click on the Format button, choose Borders, and add borders on all except the left side. Click on OK.

3. Open the Character dialog box (Command-D), and select a 10-point font that is subscripted by 2 points and condensed by 1.5 points.

4. Open the Paragraph dialog box (Command-M), and set the line spacing to -.24 inch (make sure you specify a minus setting). Click on the Position button. For the Horizontal setting, select Left and Page. For Vertical, select Top and Page. This positions the ruler in the margin so it doesn't interfere with the text. Click on OK, and close the Paragraph dialog box.

Number every fourth cell of the table from 1 to 11, and you have your ruler. Keep a copy of the ruler in the Scrapbook (or as a Glossary item), so you can paste it wherever you need it. You'll probably want to cut it after you've finished with it — otherwise it takes up space in galley view (the standard document-viewing mode). To cut the ruler, switch to galley view (Command-B toggles between Page and Galley View), and delete both the ruler and the empty line above it.

Robert Fraser Chandler, AZ



Figure A: DTP programs have vertical rulers, so why not word processors? Microsoft Word 4.0's Table function lets you create a narrow ruler you can place inside your document's left-hand margin.

POWER TOOLS TIP SHEET

enough for all except the monitor-cable connectors. To handle these, I simply slit the tubing lengthwise and then taped it back together.

Al Frank Edina, MN

Scanners

Scanning text that is 12-point or smaller can cause problems, especially when you're using a font such as Times that has thin stems. Even if you scan at 400 dots per inch, the thin stems tend to break up and, in many cases, disappear. If you use a scanner to do OCR (optical character recognition) work, you may find that the text reproduces so badly that it's unreadable by the OCR program.

However, you can dramatically improve the quality of OCR scans by putting a piece of red rubylith over the pages to be scanned (rubylith, available from art-supply stores, is transparent plastic film). This approach often works better than using the scanning software's Darken command (if it has one). This technique works with both flatbed and hand-held scanners.

Danny Wong Toronto, Ontario Canada

Microsoft Works 2.0

If you want to create layouts with multiple columns of text in Microsoft Works 2.0, you have to use the Draw mode to create the columns. Unfortunately, you can't produce goodlooking justified text in this mode, because the last line of each paragraph will also be justified, even if it contains only two words (see Figure 1).

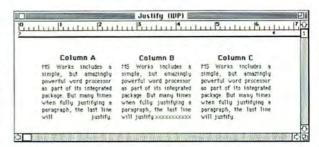


Figure 1: When you fully justify text in Microsoft Works 2.0, the last line of each paragraph also justifies (left). Make your columns look better by filling the last line with xs (middle) and then making these characters white (right).

To get around this, use the following technique after you've finished editing the text and have placed the columns in the document:

1. Go to the last line of each paragraph, and completely fill the space between the last word of the paragraph and the right margin with xs (or any other

character you want).

2. Select the xs, and choose White from the Color – Black Dots submenu, on the Format menu. This makes the row of xs invisible on a white background. The columns now print flawlessly.

Tim Howard Indianapolis, IN



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On Beyond MiniFinders

If the 1,000 MiniFinders featured in this issue of *MacUser* only whet your appetite for more, then check out the Zmac Buyer's Guide database. This comprehensive 3,000-product database incorporates MiniFinders plus information gleaned from *MacWEEK* to help you make crucial buying decisions. The Zmac Buyer's Guide is available as an interactive on-line database (type GO ZMC:GUIDE) or as a downloadable text file. The tab-delimited text file is suitable for importing into several popular database templates or into a HyperCard stack, all of which are also available on-line. To download the full 3,000-product Buyer's Guide, type GO ZMC:DOWNLOAD and locate the file BUYER.TXT in Library 7 (Reference). If you want to look up only a specific category of Mac product, such as hard-disk drives, search for the keyword *BUYER* to locate the available subcategories. A special MiniFinders format of the text file gives you only the products that *MacUser* has reviewed and rated.

PostScript-Font Catalog Now On-Line

Shareware display fonts have cleaned up their collective act recently with a spate of ATM-compatible Type 1 PostScript fonts. We screened 200 shareware typefaces and came up with the top 50 Type 1 fonts. We've assembled the Shareware Font Catalog so that you can preview what the fonts look like before paying for connect time to download them. Most of these fonts are free or require a shareware fee of less than \$15. Get the Shareware Font Catalog in Library 4 (Fonts) of the Download & Support Forum on Zmac. (Type GO ZMC:DOWNLOAD.) The filename is FNTCAT.SIT.

Also in This Issue

To learn more about the Byzantine commands and pathnames in the Internet maze (mentioned in Owen W. Linzmayer's Power Techniques article "How to Get On-Line Support" in this issue), you can download the Hitchhiker's Guide to the Internet. This text file details the intricacies of the world's densest telecommunications service. The filename is HHIKER.SEA, and it's in Library 7 (Reference) of the Download & Support Forum.

How to Join Zmac

Here's how you can get access to Zmac:

. If you're a CompuServe (CIS) user, just type GO ZMAC at any ! prompt.

• If you're not a CIS subscriber, you can sign up for Zmac by following these directions:

1. Call (800) 635-6225 (voice) to find your local access number.

Set up your modem and telecommunications software with the following standard Mac settings: 8 bits, one stop, and no parity.

3. Dial your local access number. When connected, press Return. You'll see the following prompts on-screen. Your responses are printed in boldface-type.

Host Name: CIS

User ID: 177000,5200

Password: Z*MAC

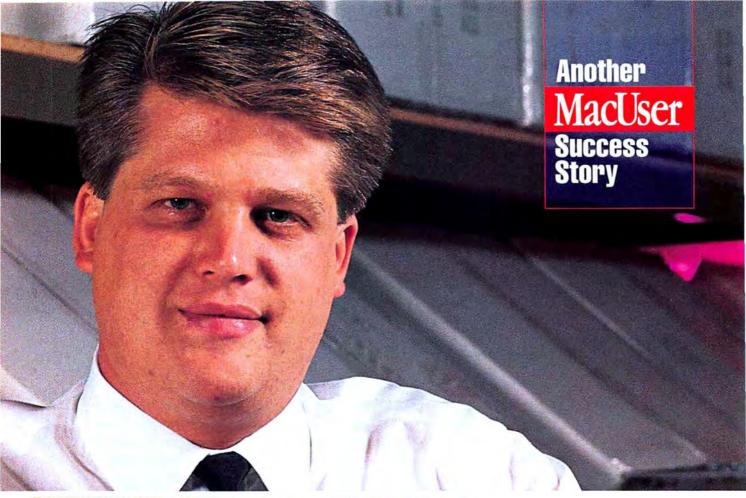
Agreement Number: Z12D9014

4. You will then be prompted for additional information, including a credit-card number for billing purposes. If you cannot bill to a credit card, call the CompuServe customer-support line listed below. Sign-up is free, but normal access time is billed at \$12.50 per hour.

5. Call CIS again with your user ID and password. A new password will arrive in the mail within ten

For more information, call CompuServe customer support at (800) 848-8990.

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Eric Crown, Co-owner/VP, Hard Drives International

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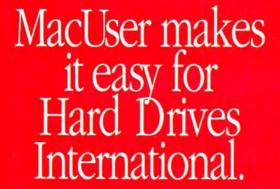
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POWER TOOLS HELP FOLDER



Questions, anyone? Here's where to get answers from the experts. Bob LeVitus is the author of the best-selling Dr. Macintosh. Andy Ihnatko isn't. But he knows a lot about the Mac, and he's got a heck of an attitude. Together, they're ready to answer your questions about everything Macintosh.

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Don't want to wait for an answer? Post your question on Zmac, MacUser's on-line service, and get a reply from Bob, Andy, or one of the other MacUser experts. See the masthead in this issue for instructions on how to sign up.

By Bob LeVitus and Andy Ihnatko

What's ResEdit?

Q. You often mention ResEdit. What is it? Who makes it? Where can I get it?

Bud Pickus

Pharr, TX

Bob: ResEdit is Apple Computer's resourceediting software. Resources, which are stored in an application's resource fork, are computer code that makes up elements of a program; windows, icons, menus, and pictures are all examples of what is stored in resources. ResEdit lets you manipulate resources to customize applications, add Fkeys, and so on. Figure 1, for example, shows how you can use ResEdit to change the pattern in a window's scroll bars. (For more on ResEdit, see "Return to ResEdit," December '90, page 273.)

Unless you're an Apple developer, you can't get ResEdit directly from Apple, but it is widely available. If you have a modem, you can download the latest version from Zmac, CompuServe, America Online, or GEnie. All it costs you is the connect time.

For those who don't have a modem, BMUG (the Berkeley Macintosh Users Group) offers ResEdit on disk for \$4 plus \$3 postage and handling. You can contact BMUG at 1442A Walnut Street, #62, Berkeley, CA 94709; (415) 549-2684.

It sounds as though you need more than just the program, however. I know of two good books, both of which include a copy of ResEdit

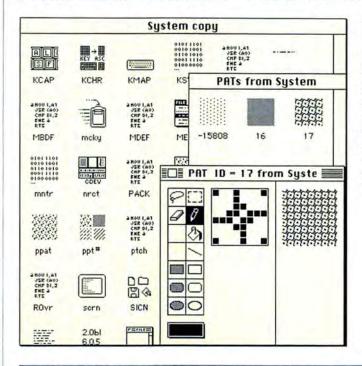


Figure 1: ResEdit lets you tweak programs and customize a program's interface. In this example, ResEdit is used to open the System file's PATs resource, which contains the scroll-bar pattern. By manipulating this resource, you can create a new pattern.

* . . . But Were Afraid to Ask

Who ever said there was such a thing as a stupid question? OK, my chem professor did, but he said it only to me. The only stupid question is the question you don't ask. Here at Help Folder, we don't care how simple you think your question is . . . just send it in! (However, if it's such a simple question that you're embarrassed to even ask it, we'll conceal your identity by crediting the question to a famous cold-cuts manufacturer.)

Q. I recently purchased a Mac Ilsi, and I've noticed that you no longer get the little yellow plastic disk-facsimile packaged in the internal floppy drive. This may not be an earth-shattering question, but when shipping a Mac, is it a good idea to put a floppy disk—either a real one or the yellow plastic doohickey—into the drive for

protection, or might this hurt the drive?

Oscar Mayer

Somewhere in the Midwest

Bob: Here's what Apple's Worldwide Peripherals Product Marketing department had to say on this one: "Since the introduction of the 1.4-megabyte drive (known as the SuperDrive), we no longer ship floppy drives with the yellow plastic doohickey, because the drives have been improved with an antitrip mechanism that keeps the heads steady. As far as how to transport the CPU and drives, it's best to do what Apple does: no floppy disk, no plastic doohickey, no nothing."

That's it — straight from the horse's mouth. Bottom line: If you have a SuperDrive, you don't need the doohickey; if you have an 800K drive, you do.

POWER TOOLS HELP FOLDER

on-disk. The first, published by BMUG, is Zen and the Art of Resource Editing (\$20 for nonmembers, \$15 for members). This book is an excellent introduction: It's short and well written and will get you started with ResEdit quite nicely. You should also take a look at ResEdit Complete (\$29.95), published by Addison-Wesley. It's more thorough, more technical, and more expensive than the BMUG book.

Andy: Just as Sumo wrestlers traditionally purify the wrestling ring before every match, by ancient and honorable tradition, we Mac writers always accompany every mention of ResEdit with the following warning: Fooling around with ResEdit can be dangerous business. Picture Yosemite Sam stumbling into a dark room, lighting a match,

Tempo II Command Universal Macros Macro File: **Button Example** Button(Do this to the top window:,Resize= Button(PlaySnd Demo,Applause=PlaySnd(cl Button(Please open a window and try this Sort bu: Button(You have (x) bytes free on Disk *(s Name CacheOff O Key code Button((warning),Cancel,Continue=FMFT) (No Key Code) Edit... Rename. Delete... Copy Macros... Change File... List Macros... Close

Figure 2: If you want to create complex macros, a third-party macro program such as Tempo II Plus (shown here) or QuicKeys 2 is de rigueur.

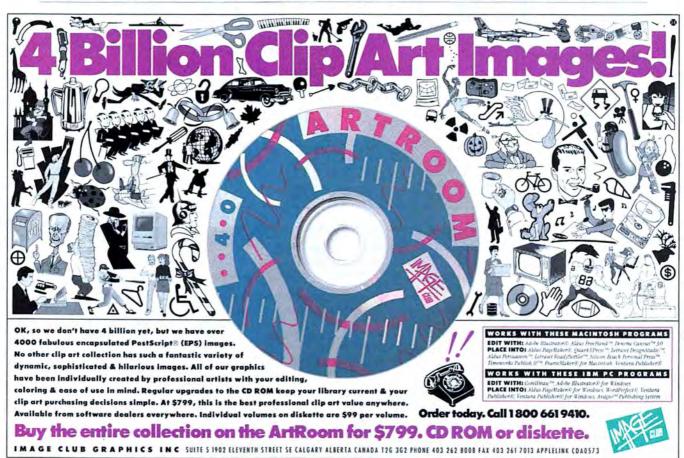
and discovering he's surrounded by gunpowder kegs ... get the idea? So when you tinker with resources, *always* work on a copy of a program and not on the original program.

That said, I encourage all Macintosh owners to get Res-Edit and start playing. There is no swifter path to being named Jedi Artichoke of the office/ lab/campus than to be seen using a copy of ResEdit with confidence and reckless abandon — and success.

WYSIWYG or DizzyWYG?

Q. Are all Mac Pluses alike in WYSIWYG (what you see is what you get) performance? I use Word 4.0 to compose and lay out a newsletter on the Plus (with ATM) in my office. I

then save the newsletter on a floppy and walk it over to another Plus (without ATM) that's connected to a laser printer. When I print, I discover that the page layout has changed — the columns have shifted, and there is more "room" at the end of the document. I suspected that ATM was the culprit, so I turned it off on my machine,



rebooted, checked the format of the document, and still encountered the problem on the other machine when I tried to print. What's going on here?

Jim Joska

Sacramento, CA

Andy: I'm willing to bet that the problem lies with your printer drivers. Make sure that you have the LaserWriter driver installed in the System Folder on the Mac you're using to create the document and that you've selected it in the Chooser before you start working. You tell a Mac application about the sort of paper you're using in the Page Setup box, which can change depending on which printer driver you've selected in the Chooser. If, for example, you've selected the ImageWriter driver, your Word document is laid out based on the paper size you've selected in the ImageWriter's Page Setup dialog box and also on which areas of the page the ImageWriter's print head can actually move to and print on (the "maximum imageable area" of the page). When you carry the disk to the Laser-Writer's Plus, Word jiggers all the page elements around to fit the LaserWriter's page setup, and shazam! - you get messed-up formatting and frayed nerves.

Also, make sure that the individual settings within the two LaserWriter Page Setup dialog boxes match; it's possible to give the LaserWriter a larger print area, and failure to match this setting on your personal Mac will probably lead to more of the same problems.

MacroMaker Broke

Q. I have a Mac II with System 6.0, on which I have used Microsoft Excel 1.5 and Apple's MacroMaker 1.0.1 without any problems.

As soon as I started using Excel 2.2, however, I discovered that MacroMaker 1.0.1 wouldn't work anymore. Will upgrading to System 7.0 solve my problems, or is there an updated version of Macro-Maker I can use?

Carlos Sanders Lomita, CA

Bob: First, according to Microsoft tech support, there is an incompatibility between MacroMaker 1.0.1 and Excel 2.2. You need MacroMaker 1.0.2, which is included with System-software versions 6.0.5 and 6.0.7. MacroMaker 1.0.2 should work properly.

Next, you probably should not be using System 6.0 — it has several known bugs. Upgrade to System 6.0.5 or later as soon as you can.

Finally, System 7.0 will definitely not solve your problems; in fact, it could make them worse. MacroMaker 1.0.2 doesn't work with System 7.0, and Apple is no longer supporting it. So if you're planning to upgrade to System 7.0 and want MacroMaker-like abilities, you'll need to buy a thirdparty macro program. 1 recommend QuicKeys 2, from CE Software, or Tempo II Plus (see Figure 2), from Affinity Microsystems, both of which should have System 7.0-compatible versions available by the time you read this.

Even if you plan to continue using System 6.x, you might want to investigate QuicKeys 2 or Tempo II Plus. Each is significantly more powerful than MacroMaker.

Andy: A third-party macro package is really de rigueur. The only thing MacroMaker's useful for is seeking an answer to the legendary philosophical question "Was MacroMaker written to make all Microsoft programs crash, or are all Microsoft programs written to make MacroMaker crash?" Very Zen.

Ghosting and Cracking Laser Type

Q. When we print on letterhead paper and envelopes with our laser printer, the type ghosts and cracks. Once a letter has



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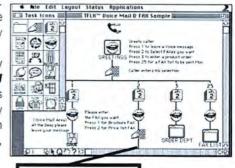
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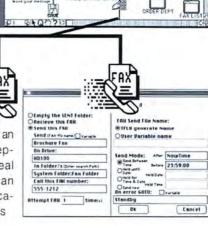
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gone through the printer and has been run through the postage machine, there is a ghost
image of the middle part of the
letter on the bottom of the page.
Because the bottom third is
folded to come in contact with
the middle third, we suspect
that the pressure from the
postage machine makes the
type rub off. On envelopes, the
type cracks and flakes off by
the time a letter arrives at its
destination.

We've tried many different kinds of paper — some specially made for laser printers — but the problem still occurs. Is there special toner that reduces this problem, or will we just have to use cheap-looking, copier-type paper for all our work?

Mike Norris Danville, KY Bob: First, go to an artists' The file "Data 8" could not be opened/printed (the application is busy or missing).

supply store and buy a can of spray-on fixative. It's what artists spray on drawings and sketches to keep them from smearing. Not surprisingly, it's perfect for preventing laser-printer toner from smearing. Hold the can as far away from the paper as you can to spray a very light coating on letters and envelopes. This should solve most of your problems.

Then experiment to find the kind of paper that works best foryou. As you say, some kinds of paper are better than others. Once you've decided which kind does the trick, have your next batch of letterhead and envelopes printed on it.

Andy: Now that laser printers are a certified fixture of the '90s office, lots of paper manufacturers are scrambling to produce quality papers that won't cause trouble with machinery (for some suggestions, see "The Paper Trail," March '91, page 181). It may take some time on the phone with your office-supplies rep, but I'm sure you'll be able to find a laser-studly paper stock that fits with your corporate image.

Figure 3: If your Mac insists that applications are busy or missing (even if they aren't), it's probably a sign that you need to rebuild your desktop. Other signs are folders and files that are painfully slow to open.

You might also consider using a heavier typeface. I'm told that, depending on the paper, type with thicker stems may have less ghosting.

Application Out to Lunch?

Q. I've got a Mac Plus, 2.5 megabytes of RAM, and a 60-megabyte external hard-disk drive. Two days ago, for no apparent reason, everything came to a grinding halt. The symptoms:

•When I try to open a document from the desktop, I

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get an error message that tells me the application is "busy or missing" — even if it's not. I can open documents only if the application is by itself on the desktop and not in a folder.

•It takes forever (or close to it) to copy files from a floppy onto my hard disk. At times it almost seems as though the screen has frozen.

 It takes at least five minutes to open the System Folder.

Here's some information you might find useful: I've recently added quite a few Post-Script fonts to my collection, and my System Folder is filled to the brim with printer-font files (the screen fonts, incidentally, are managed by Suitcase II). Could this affect overall performance? Am I headed for a complete crash? Please help.

Marcy Poulos Sparta, MI Bob: The "application busy or missing" syndrome is a common symptom of a damaged desktop file (see Figure 3). The desktop is an invisible file (meaning that you can't see or modify it without special tools) on every Mac disk. It contains important information for the Finder about the files on that disk.

The solution: Rebuild the desktop file. This is easy to do; just hold down the Command and Option keys while starting up your Mac. You'll see a dialog box that asks if you're sure you want to rebuild the desktop. Click on OK (this technique works under both System 6.x and System 7.0). If you run System 6.x under the Finder (not MultiFinder), you can also rebuild the desktop by holding down the Command and Option keys when you quit

any application. You'll see the same dialog box, and the results are exactly the same as with the previous technique. When you rebuild the desktop, your Mac will spin and whir for a while, but when it's finished, your problems should be over.

Your other problems are also symptoms of a desktop that needs rebuilding - copying files takes a long time, and folders containing lots of files (such as the System Folder) take forever to open. The reason for this is that the invisible desktop file isn't a very good housekeeper. It usually retains information about files that have long since been deleted. This excess information makes the invisible desktop file swell to gargantuan proportions. Unfortunately, the larger your desktop file, the slower things such as file copying and folder

opening go. Also, swollen desktop files are more likely to become corrupted, leading to disks that won't mount and — yes — to system crashes.

For years I've advised my friends to rebuild their desk-tops every month or two. Apple used to recommend that you do it once a year, which I didn't think was often enough. Apple seems to have changed its tune, though — the System 7.0 documentation recommends rebuilding it once a month or every other month.

Besides rebuilding your desktop, here's something else you should do just to be on the safe side: Scan your system for viruses, and make sure that you have some sort of virus protection installed.

By the way, did you know that Suitcase II allows you to place those printer-font files in

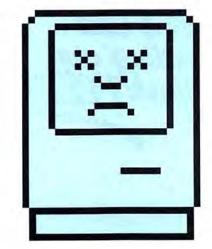
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any folder you like? As long as the printer fonts and the screen fonts are stored in the same folder, they'll work fine.

Andy: One of the reasons this desktop business is so wretchedly inefficient is that the original desktop file was designed to deal with several dozen files per volume, rather than the several hundred we deal with today. One trick for getting around this is to find a friend who has the AppleShare server software and beg, borrow, or steal a copy of Apple's Desktop Manager INIT. This INIT replaces the Finder's normal mechanism for managing the desktop with a more efficient and faster mechanism (for more on the Desktop Manager, see "Net Prophet," April '90, page 275).

Finally, you could consider partitioning your disk. My 85megabyte drive's performance picked up noticeably when I put the System Folder, my applications, and my documents into their own individual partitions. Because each partition has its own desktop file, you'll avoid the commonplace Too Dang Many Files problem.

Bob: For what it's worth, System 7.0 has the Desktop Manager built in to it and is much better than earlier versions of the System software when dealing with disks containing thousands of files and folders.

Watching the Connectives

- Q. I've got three questions I can't seem to find any answer to. Could you give them a shot?
- Can you add an ADB (Apple Desktop Bus) port to a Mac Plus?

- 2. Does any company manufacture an interface that lets a DAT machine function as a hard-drive-backup device?
- 3. Does anyone make a universal AppleTalk box that lets devices that normally communicate with the Mac's serial ports function in a network environment (specifically, using a MIDI interface)?

It seems as if I'm having trouble connecting.

David Reichert Spring Valley, NY Andy: 1. No, you can't add an ADB port to a Plus.

2. Yes and no, but more no than yes. The fact is, the guts of a DAT player and a DAT backup device (or of a CD player and a CD-ROM drive) are indeed practically identical. The reason the latter can't be used as the former is that most designers didn't think that

the average audiophile shopping for stereo equipment would want an industry-standard SCSI (small computer system interface) port, which is what you'd need in order to get these players working with a Mac. Out of the box, there's no way to get raw, digital information (not the "music" but the data that represents it on the tape or disc) out of the drive and into the Mac, so, if you're hoping to make all that high-priced audio gear taxdeductible as a legitimate business expense, you'll have to claim it as a dependent.

Looking on the bright side, almost all DAT recorders (and some of the obscenely expensive CD players) have real digital connectors for making digitally perfect copies of digital recordings. If some enterprising company were to



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determine that there's a market for a DAT-to-SCSI/Mac interface box, it wouldn't be an insurmountably difficult project to complete. I don't know of any company actually working on such a device, but it's not impossible.

3. And on to the universal-AppleTalk-box question. Finally, something I can answer with a yes! The NetSerial, made by Shiva, does exactly what you want. You plug the serial device (for example, a label printer) in to NetSerial and NetSerial in to your AppleTalk network, and you're in business. Now any Macintosh on the net can use the serial device simply by accessing it through the Chooser (to do so, each Mac has to have the NetSerial cdev installed). Other than that, operation is transparent. We have a couple of NetSerials

installed at the Boston Computer Society/Mac office, and they work great.

Get in Touch

Q. Through which on-line services can I contact you?

Lance Chun via GEnie

Bob: I'm on GEnie (R.LEVITUS), America Online (LEVITUS), and Zmac (76004,2076). See the masthead in this issue for instructions on how to sign up for Zmac. Icheck my mail on these services several times a week.

Andy: You can reach me on Zmac (72511,204). I'm not on GEnie or America Online, but I use local bulletin-board services such as the Graphics Factory ([617] 849-0347) and the Boston Computer Society's BBS ([617] 625-6747).

Separator Anxiety

Q. In "19 Ways to Customize Word" (September '90, page 302), Craig Danuloff explains that the Separator entry that comes at the end of Word 4.0's Commands dialog box is used to add dimmed lines to custom menus.

I want to add a separator in the File menu between Quit and Fast Save Enabled, but every time I try, I get a separator at the *end* of the menu instead. Is there any way you can control where a separator is placed in a Word 4.0 menu?

Jay Lechtman Reiserstown, MD

Andy: Unfortunately, you can add a separator only to the very end of a menu; you can't tell Word to stick one between X and Y. To do that, you need to delete all the menu items that you want to put under the

separator; add the separator; and replace the menu items one by one, using the Append radio button before clicking on Add. Using Append ensures that the menu items go exactly in the order you specify rather than conforming to the whimsical ideas of certain corporate software juntas.

Bob: In defense of the corporate software junta in question, it should be noted that Microsoft is the only publisher that provides a mechanism for adding and deleting commands from your word processor's menus. It may not be pretty, but it's certainly a good feature.

Andy: Good point. Just be happy Microsoft doesn't design cars. "I'm sorry, officer, my husband must have edited the Buick Settings file this morning. Yesterday that pedal was for the brakes!"

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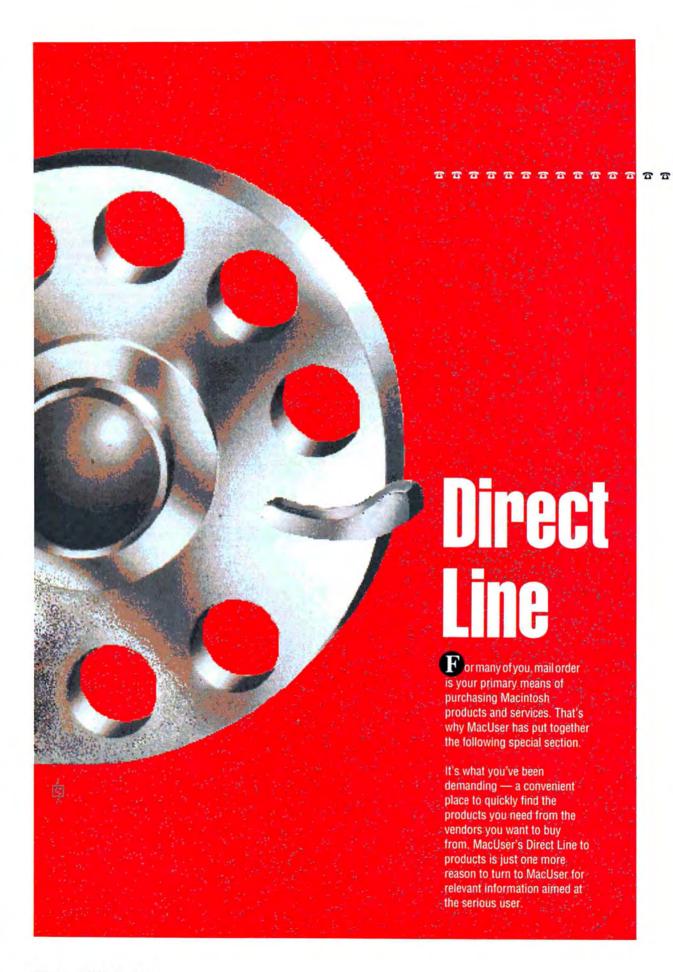
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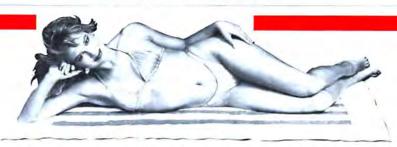
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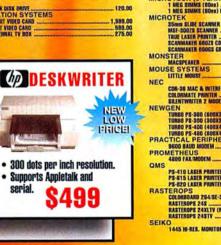
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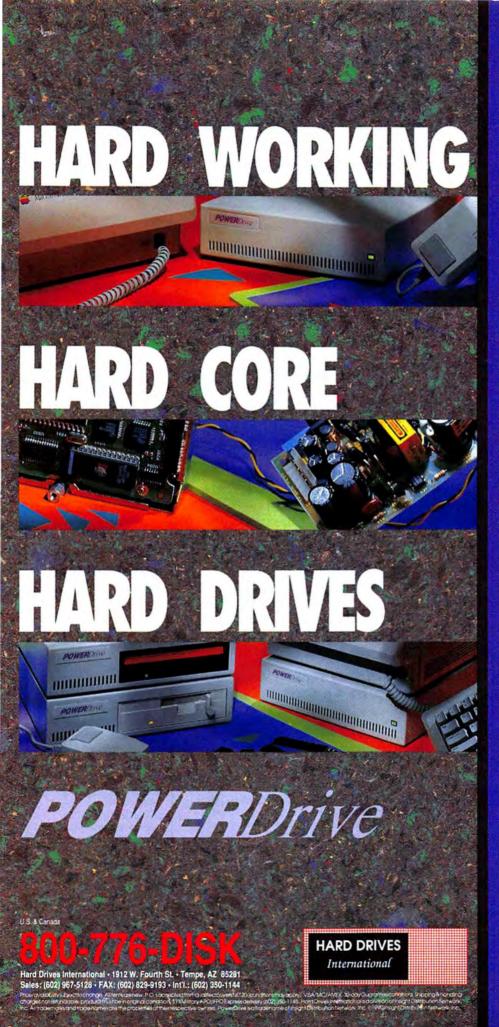
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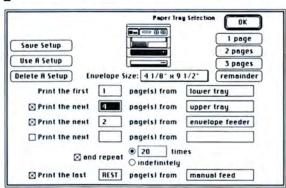
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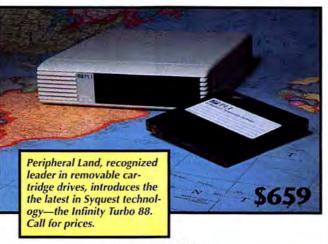
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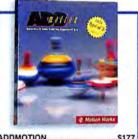
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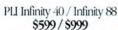
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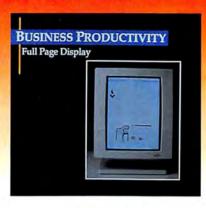
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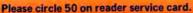
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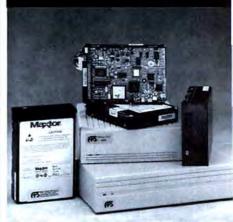
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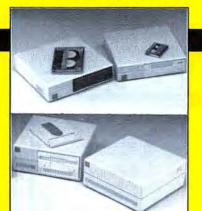
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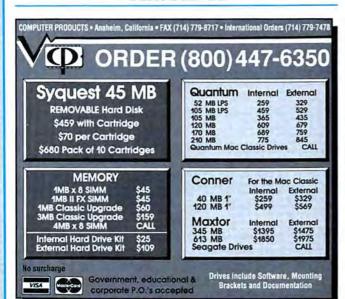
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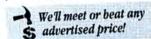
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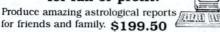
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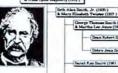
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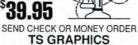
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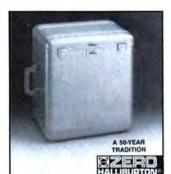
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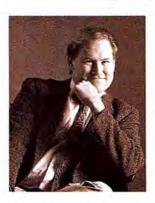
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ord processing on the Mac hasn't improved one iota since MacWrite came out seven years ago. We've seen better conversion utilities, some column capabilities, and a few other minor things—but the potential for a new, modern Mac word processor has not been exploited. Now many word processors for Windows and the PC are as powerful and easy to use.

Here are seven suggestions that can and should be implemented by word-processor designers:

1. Envelope printing. Every word-processing program should be able to bar-code and print envelopes sideways effortlessly. It stuns me that a product such as MacEnvelope can stay on the market this long without one single word-processor publisher saying, "Duh, why don't we do that?"

2. Paint-style cut-and-paste. Cut-and-paste in Mac word processors is a fraud. It's not much better in desktop-publishing packages. You typically block off some text with a select-block technique, cut it into the buffer, and then paste it someplace else. But human cutting and pasting doesn't work this way: Text should be cut out as if you were using scissors. And you should be able to lay it anywhere — even over other text. If something had to be lined up precisely, you'd create virtual lines on-screen and adjust the text with a fine-tuning option. The old block-style cut-and-paste could be an option for simple moves.

There are a lot of good reasons for paintstyle cut-and-paste in a word-processing program. If you want to adjust columns for aesthetic reasons, it can be an ideal tool.

3. Rubber margins. A good desktoppublishing program can do this, so why can't all word processors? With "rubber margins," the user selects the margin line and chooses a "rubber" option, where the margin line stays on-screen and the pointer can be positioned on the margin to pull it out to anyplace it's needed for a special effect.

4. A good spelling-checker dictionary and real thesaurus. Am I the only one who thinks that Mac word-processing programs have the worst dictionaries in the known universe? Anyone who uses both a PC and a Mac will agree that the PC's writing tools are far superior. There are dozens of spelling checkers and dictionaries along with scads of elaborate thesauri on the PC. Mac spelling checkers are not only bad but also painful to use.

The most annoying aspect of most Mac spelling checkers is the additional mouse click that's required to ask the Mac to guess. Why doesn't it do this automatically? I've always wondered why this extraneous step was so popular. But after using the WriteNow! spelling checker for a while, I realized that its publisher is too embarrassed to have the program ever guess, because its guesses stink!

Folks, let me tell you that the Mac writing tools suck big time. Let's not even bother with the mediocre thesauri. Humph.

5. Improved selection control. Here's a hypothetical situation: On page 2 of a 100-page document is a complex table with complex margins and many intermixed typefaces. It would be tough to duplicate. The text of the rest of the document is set in Geneva, but I want to change it to Bodoni. If I press Select all and choose Bodoni, this complex table will be ruined forever: There's no way to deselect this little chunk. I have to cut and paste it and hope that nothing gets screwed up. Of course, I can also hand-select the 100 pages by holding down the mouse button and scrolling for half an hour. This method is really outdated.

6. Intermixed-face-and-type adoption. Another situation similar to the one above occurs when you have a huge document and you want to change the type from 12-point to 11-point, except that the 12-point type also contains 15-point heads. After making the global change, you have to go through all the pages and, like a cannibal, try to find all the shrunken heads. This also happens if you have mixed typefaces in a document. Why can't you just tell the word processor to change all instances of Helvetica to, say, Tekton, without changing any other font? This shouldn't be hard.

7. Finally, NEW special effects. Since the invention of MacWrite, we've seen outline, shadow, and shadow outline — and nothing since. Seven long years have passed without anything new being added. I would like to see chroma, neon, and a dozen other stock effects, but apparently today's programmers are still so blown away by Bill Atkinson's original (and old) ideas that they can't even think of one new thing!

Are these ideas impossible to implement? Are they impossible to code? How long are the Mac word-processing vendors going to rest on the laurels of past victories? The situation is pathetic.

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